The Iron Age

A Review of the Hardware, Iron and Metal Trades.

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New Machine Tools.

The accompanying illustrations show some new machine tools just being introduced by Mr. Chas. C. Newton, proprietor of the Newton Machine Tool Works, 2341 Callowhill street, Philadelphia, Pa. The first tool is an improved vertical drill press. In looking over the tool the practical man is at once struck by the idea that the designer has bestowed much original thought upon the machine. It is evident that the conditions and requirements of this class of machines and of the work they have to perform have been studied, and the difficulties met and overcome by good mechanical methods. Metal has been placed where it is needed to resist strains, and framing strengthened where, in the ordinary forms, strength is lacking. The tool belongs to the class of column drill presses in which the table is raised and lowered upon a cast-iron column. This column usually forms the support for the whole upper part of the machine, and is a part of the framing. One of these columns is shown in section in Fig. 2. In the new press the column is an independent member, firmly secured to the bed plate and frame, but having only its own work to do, and, in order to increase its stiffness, it has a web cast in its center. Fig. 3 shows a horizontal section through the column and frame. In regard to the advantages of the machine, we can hardly do better than to quote some remarks made by Mr. Newton in describing the machine to us: "It will be noticed that, unlike the ordinary drill press supported by a single column, this one has an improvement which makes what is generally the weakest part the strongest. The strength of this tool is not dependent upon a single column, nor the stiffness of the head upon a single arm. The column, which is hollow, has a web running through it. Fig. 3 represents a cross section of column and frame, while Fig. 2 shows the usual form extensively used. This web is five-eighths of an inch thick, and is believed to increase the strength of the column fully one quarter. The manner of attaching the column deserves special attention. It has a collar at the bottom, and, being nicely fitted to the hole in the frame, is drawn up so firmly by a key at the top that it becomes as rigid as if it were cast solid with the frame.

"The frame is double-flanged and very stiff, hence it is not likely to vibrate when heavy work is placed upon the table. That portion of the frame where the rotary power is transmitted to the spindle is extra strong, being strengthened by the addition of an upright connecting the upper part of the frame with the middle portion. This upright also forms a bearing for the cross-shaft. In this machine the strain is distributed upon three columns instead of upon one, as has heretofore been practiced. The machine is back geared, and is also provided with a quick return motion and a work holder."

The balance weight is placed above the machine and not within the body of the column, as in the common forms of press. The details of the feed motion are nicely worked out, and there is no loss of time in changing from fast to slow motions, nor in fact in any of the adjustments.

Fig. 4 is a new Gun Milling Machine, which Mr. Newton has designed for the use of armories, sewing-machine factories and for others. A heavy machine of the same style is also built for railroad shops, locomotive works and electric-light companies. The carriage is 29 inches long, and the worm gear by which it is driven runs in a box of oil. This construction was adopted to secure perfect lubrication. The box contains about half a pint of oil, which is sufficient for a long time. The bed is made 30 inches deep, and is of the box pattern, so well known in connection with Philadelphia tools. The upright guides, it will be noticed, are solid in one piece, a method of construction greatly superior to the old-fashioned way of using posts, of which eight would be needed to take their places, and would be very much more likely to spring, while being more costly. The head is so arranged that it can be adjusted without stopping the machine. The disconnecting arrangement is by a clutch. Automatic feed can be run at the same time that the work is moved by hand in either direction. This curious and valuable result is obtained in a most simple but unexpected fashion. The nut revolves to feed, while the hand motion is produced by the screw; hence, both may be in operation at the same time without interference. This is a novel and valuable feature. The workmanship on the machines which we examined was of the finest character, and the tools rank high in a city proverbial for its fine tools.

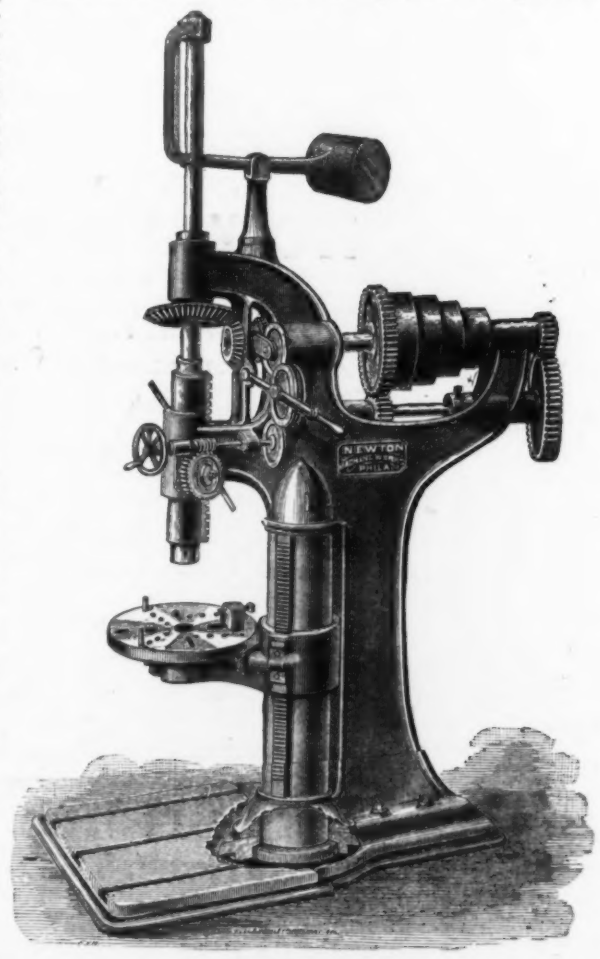


Fig. 1.—Improved Vertical Drill Press.

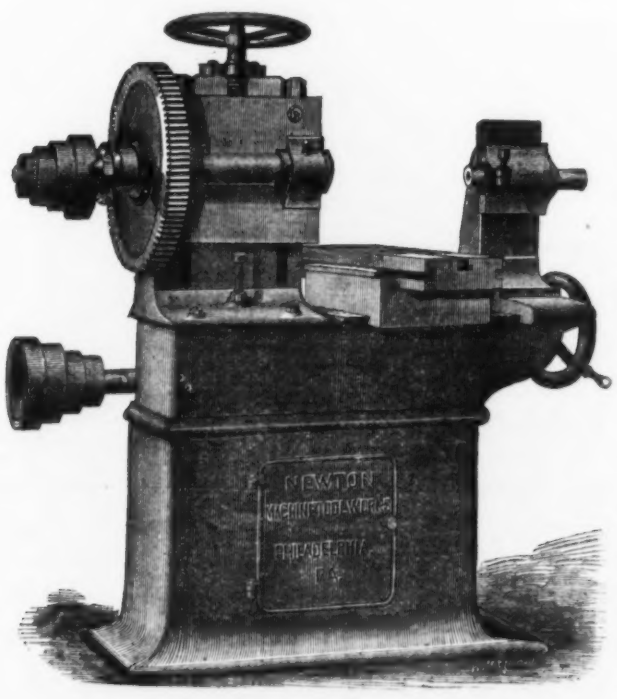


Fig. 4.—New Pattern Gun Milling Machine.

NEW MACHINE TOOLS, BY THE NEWTON MACHINE TOOL COMPANY.

Large iron ore deposits of great richness and value have lately been surveyed in Lapland by practical mining engineers. The district is near the village of Inkkasjarvi, in Swedish Lapland, about 10 miles from one of the arms of the West Fjord. Analysis shows over 70 per cent. of metallic iron in this ore, and the quantity is said to be sufficient, at the present rate of consumption, to supply the entire world with iron for many years. It is intended to construct a railway from Fagernaes, on the West Fjord, to the district in question, in order to develop its resources, and it is stated that the attention of English and Dutch capitalists has already been directed to the value of the ore by one of the Swedish officials.

The Manufacture of Bessemer Steel and Steel Rails in the United States.*

In continuation of the information presented to the Institute in May last, I have now the honor of submitting some particulars of the operations carried on at the Edgar Thomson Steel Works during the first six months of 1881. In that period the two converters at work produced 76,758 tons of ingots, as against 55,428 tons for the corresponding half of 1880, being an increase of a fraction over 38 per cent. In the converting department, with two converters each of 7 tons capacity, the best 24 hours' work has been 623 tons. The largest production in a single week has been 3433 tons; and the best month's work has been 14,033 tons.† The rail mill, in the same time, has produced 65,087 tons of rails, as against 43,272 tons in the corresponding half of 1880, being an increase of a fraction over 50 per cent.‡ The average weekly yield of rails during 1881 was, therefore, 2503 tons, as compared with an average of 1664 tons per week in 1880. In some weeks, however, these averages have been greatly exceeded. During



Fig. 2.

the week ending July 30, we rolled 11,278 rails of 56 pounds per yard, aggregating 2808 tons. In the following week we rolled 11,285 rails of 60 pounds per yard, aggegating 3004 tons; and for the week ending August 13, we turned out 12,219 rails of 57½ pounds per yard, making a total of 3101 tons.

I have reason to believe that the production of rails at these works during the fortnight ending August 13 is the greatest that has yet been obtained in one mill. I am fully aware of the claim made on behalf of the Cleveland Steel Works of Bolckow, Vaughan & Co., that during the week ending Saturday, May 21 last, 3623 tons of rails were rolled in one mill,* but I am informed by one who was present during the time that this large production was obtained by Mr. Windsor Richards, that the rails were double-headers of 80 pounds per yard. Assuming this to be the fact, you will find, on a comparison of the number of rails rolled, that our output at the Edgar Thomson Works greatly exceeds that of the Cleveland Steel Works. If we take the 12,219 rails rolled here during the week ending August 13 at 80 pounds per yard—the weight of the rails rolled at Eston, making the usual allowance for short lengths, we should have a weight of at least 4320 tons. I am not, therefore, prepared to admit the claim made by Mr. Richards, at the May meeting of the Institute, that "we beat the Americans in rolling rails."† At the Edgar Thomson Works the output of the rail mill is limited by the quantity of steel furnished by the converting department, and for that reason we anticipate still better results when the three new converters now being erected have been got to work, as thereby the rail mill will be fully supplied. What the American three-high mill is capable of doing in the way of rolling rails is still an unsolved problem. Until quite lately I was disposed seriously to doubt whether it could equal the output of a reversing train such as those used at the Dronfield and Cleveland Steel Works in England. If Mr. Windsor Richards will kindly furnish the Institute with the largest number of rails rolled in a given time at the Cleveland Steel Works, a better comparison could then be made of the real merits of each of the two systems of rolling.

With reference to rolling off direct from the ingot, I would put it to English steel makers whether they are not compelled to carry an excess of manganese in their steel to prevent heavy loss by reason of second-class rails? The percentage of second-class rails obtained is an important factor in judging of the true merits of any system of rolling, and some information on this point would be of interest to the trade. Apart from the necessity of using a greater amount of manganese and the turn-out of a higher percentage of second-class rails, I do not for a moment question that in the reversing rolling mill, rolling two or more lengths, as at Dronfield and the Cleveland Works, there is a great economy of labor and of waste.

It was suggested in the discussion that followed the paper which I had the honor of submitting to the Institute in May last, that the great yield of American steel works must represent a larger cost per ton than the average of English practice. To this I reply that, as most of the workmen are paid on a tonnage basis, the cost cannot be increased according to output; but, on the other hand, the charges debited to interest and general expenses, as well as the day-labor account, are always lower in proportion as the output is increased.

* A paper by Capt. W. R. Jones, of the Edgar Thomson Steel Works, Pittsburgh, Pa., read at the London meeting of the Iron and Steel Institute.

† In all cases I quote the gross ton of 2240 pounds.

‡ The rail mill is three-high, with rolls 23-inch pitch, the train being driven by a 46 x 48-inch engine having balance slide valves.

* *Vide* Journal, No. I, 1881, p. 222.

† *Ibid.*, p. 143.

The Original Locomotive.

A correspondent of a foreign exchange, describing the display of locomotives at Newcastle, England, on the occasion of the Stephenson Centenary, says:

A great sight was in the sheds at the extreme end of the works, for here were assembled some sixteen locomotive engines, just arrived from all parts of the country—the choicest specimens owned by the several companies by whom they had been dispatched to take part in what the programme called a "display and procession of modern typical locomotive steam engines." I was examining with great admiration one of the very finest of these engines, built for the Midland Railway Company by Messrs. G. R. Stephenson & Co., of Newcastle, when I was attracted by a lively movement among the crowd of mechanics who stood about me, and looking round, I perceived an ancient and decayed little engine being cautiously propelled by a huge goods locomotive along the metals which led to the high level bridge. It was like a very old man supported on the arm of a big stalwart son, and the great locomotive frequently paused to give the aged engine, as it were, time to breathe and recover itself. I crossed the rails to look at

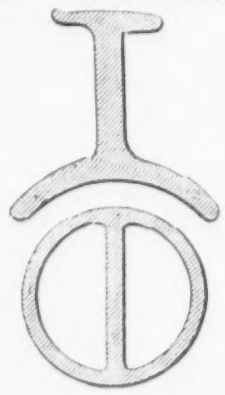


Fig. 3.

this singular object, and drawing very close to it I was able to read upon a plate affixed to its side that its name was "Locomotion," that it had been constructed by George Stephenson in 1825, and that it was the first engine that ran on the Stockton and Darlington Railway. So here, then, was the very father of all the locomotives in the world. A decrepid, shriveled machine, with, nevertheless, a look of shrewd self-consciousness suggested in its quaint old-world aspect, as if it had duly taken note of its magnificent posterity and was not unwilling to be admired for their sakes as well as its own. To see the wonderful old locomotive crowned with a skeleton scaffolding, piston rods and other working gear, with its singular chimney, curving out of its front like the neck of a swan, and the little old tender behind, with part of the iron side rusted and rotted out, while close to it stood a group of probably the most magnificent locomotive engines in the world, with their sparkling brass-work and glossy sides as clear as glass, with the amazing finish of their painting and varnishing, was indeed to behold the one sight that would give to the great memory with which all Newcastle and Gateshead had already transfigured themselves without bunting to do honor, the eloquent and moving significance that could be imparted to it.

Separation of Metals in Alloy.

The following methods of separating different metals are given in a report on analytical chemistry: *Zinc.—Separation from Cadmium.*—A. Yver. The solution containing the two metals as acetates is treated with two or three grams of acetate of sodium and a few drops of acetic acid, and then subjected to electrolysis. The battery used consists of two Daniell's cells of the usual form. The cadmium is completely precipitated upon the negative pole, while all of the zinc remains in solution. The deposition takes places in the cold, and is complete within three or four hours, when the quantities of the metals range between 0.180 and 0.210 gram. *Nickel and Cobalt.*—Messrs. H. Fresenius & F. Bergmann have undertaken to ascertain the conditions most favorable for the electrolytic deposition of nickel and cobalt. They recommend for both a solution containing in 200 c. c. from 0.1 to 0.15 gram of the metal as sulphate, from 2.5 to 4 grams of ammonia and from 6 to 9 grams of sulphate of ammonium; a current equivalent to 300 c. c. of electrolytic gas per hour, and a separation of ⅓ to ½ cm. for the electrodes. A presence of less ammonia does not yield favorable results. Larger quantities retard the deposition, but do no further harm. *Cadmium.—Separation from Copper.*—G. Vortmann. The dilute solution is treated with hyposulphite of sodium until it becomes colorless, and then heated to the boiling point. The copper precipitates as sulphide. *Silver. Electrolytic Deposition.*—The tendency of silver to precipitate in a spongy or flocculent condition when deposited from an acid solution by electrolysis can be avoided by employing a weak current and dilute solution. The following conditions were found to be the most satisfactory: A solution containing in 200 c. c. from 0.03 to 0.04 gram of silver and from 3 to 6 grams of nitric acid; a separation of the electrodes of one centimeter; a current sufficient to yield from 100 to 150 c. c. of electrolytic gas per hour. From a dilute neutral solution the silver deposits in a flocculent condition however weak the current.

Uses of Asbestos in Chemical Laboratories.—The remarkable properties of asbestos, such as its non-combustibility and its resistance to the action of acids, render it peculiarly well adapted for use in chemical operations. It was employed centuries ago for the process of filtration of liquids, a plug of the material being inserted in the neck of the funnel through which the liquid was poured. The asbestos paper produced at the present time presents an excellent material for filter paper, as the latter can be washed an almost infinite number of times without being destroyed. The working tables of laboratories may be furnished with coverings of thick sheets of this paper, which coverings prevent any destructive action of acids, however strong the latter may be. In addition, the material is elastic to such an extent that articles of glass may be allowed to fall upon it without serious risk of fracture. [illegible] paper under consideration is moreover for elec[illegible] in the manufacture of porous cells the hands w[illegible]caries, gloves, coverings for and various other [illegible]ng corrosive products [illegible]utility.

A 2500-Horse-Power Steam[illegible].—Some time ago the construction of a [illegible] horse-power steam engine for one of the mines of this country was proposed. Before having completed the design, however, it was thought advantageous to increase the power of the engine to 2500-horse power, and operations were immediately commenced for its construction. It is to be a compound engine with great piston speed, the latter amounting to about 3.66 m. per second or 720 feet per minute. The cylinders and cylinder covers are to be provided with steam jackets, and the steam, when passing from the high pressure into the low pressure cylinder is reheated by coming in contact with tubes through which steam, coming directly from the boiler, passes. There are two sets of such tubes, one being located at each extremity of the cylinders, their heating surface amounting to about 65 square meters.

The *Lumberman* describes a model car wheel made of sawdust, consisting of an iron rim of 7 inches outward diameter by ½ inch thick, fitted with a well-proportioned hub, the space between being filled with pine sawdust, pressed in so solidly that a pressure of 23 tons applied to the hub failed to develop any signs of weakness.

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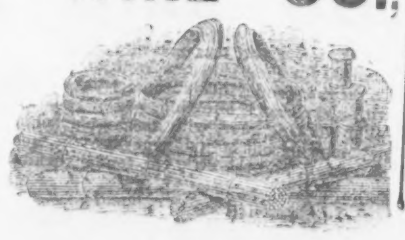
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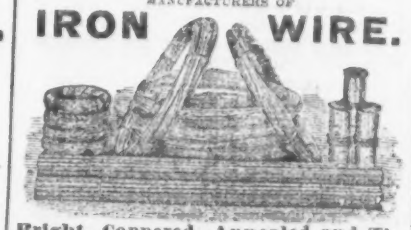
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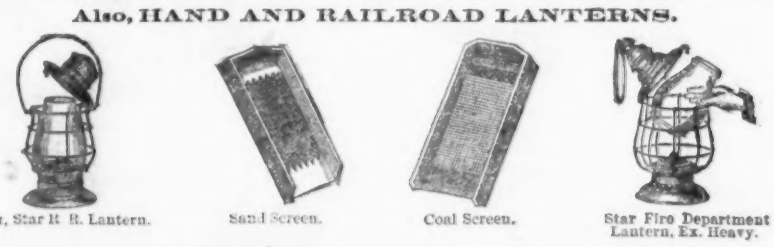
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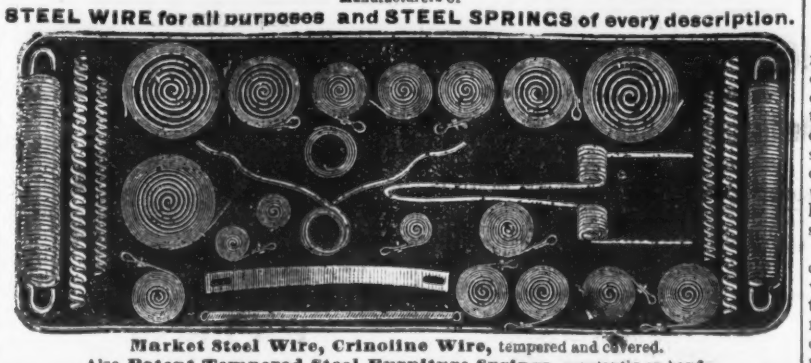
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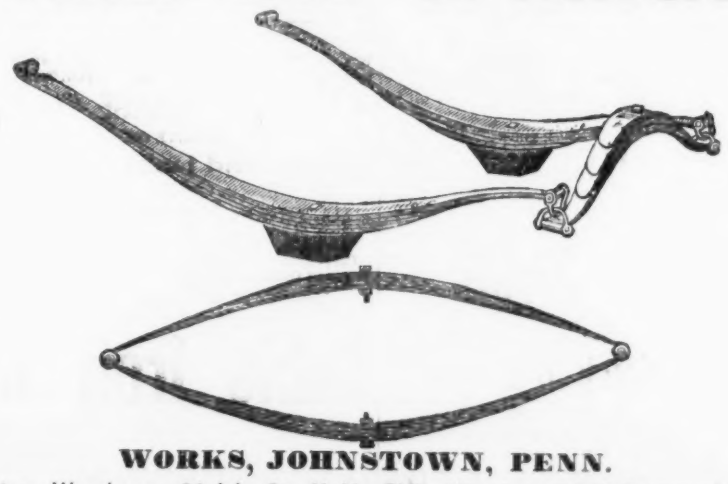
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A Note on Current Dephosphorizing Practice.*

It being now just three years since the first detailed communication on the subject of the technical possibility of a complete and direct dephosphorization being effected in the Bessemer and Siemens processes was offered to the Institute, and nearly two years since the first working on a large scale was commenced, it has been intimated that it would be interesting to many members to know in what position the matter now stands.

The more strictly scientific aspects of the question having been already treated of at various times, it is only proposed at present to give a very brief *résumé* of the technical results obtained at some of the leading dephosphorizing works, with the view of affording members the necessary data for drawing their own conclusions as to the technical and economical status of the dephosphorizing process, and giving some materials for forming a judgment on the relative advantages of manufacturing iron by the fluid or ingot pocesses as compared with the puddling or piling process. It is to be premised, however, that, as there are at present in operation only three works in which the plant has been specially arranged to meet the requirements of the new process (none of which are as yet entirely completed) it is obvious that the average results here given are very far indeed from representing the economical practice likely to be obtained in new or specially adapted plant.

The data here given are based on the results obtained in the present current manufacture of dephosphorized steel, which amounts to between 27,000 and 29,000 tons a month. It may be added that the make for November, and probably for October, will considerably exceed 30,000 tons, or say at the rate of 360,000 tons a year; while in the course of the next few months 12 more converters, now nearly finished, will come into operation, bringing the yearly make up to considerably over half a million tons.

With regard to the question of production, it may be noticed: 1. That at present, in the modified Bessemer process, the production of steel per lining is considerably less than in the old process, and that, therefore, the vessel plant, or the facilities for changing the vessel, should be increased for a given make. 2. That the make per unit of blowing and hydraulic engine power (and in consequence per unit of boiler and crane capacity) is substantially the same for both processes, and that, therefore, no increase in engine, boiler or crane power is required for the dephosphorizing Bessemer process.

As an illustration of the actual present productive capacity of old works modified for the new process, it may be mentioned that there are now at work in Germany two three vessel basic pits, each regularly turning out 24 or more charges per 24 hours, which probably equals the full average of English practice with two-vessel hematite pits. This is the more remarkable as one at least of these pits is a very old and contracted two-vessel pit into which a third vessel has been squeezed. At another German works, with an old two-vessel basic pit, which works on day turn only, the average basic output is 11 charges in the 12 hours, while at a fourth works, with an old two-vessel pit, 22 casts are regularly obtained per 24 hours.

The interest and redemption of the cost of a third vessel and its adjuncts would amount to a charge of about three halfpence per ton of steel produced. With the Holley system of removable shells there would seem to be no reason for anticipating any difficulty in obtaining from a single two-vessel basic pit any amount of steel that could be handled, or say at least 50 charges per double shift. In America, a still larger production is expected from the new basic works. The durability of linings is intimately connected with the subject of productive capacity. In present practice the necessity for considerable repairs to the lining arises after from 35 to 90 blows. Thus it appears from the returns from various works that more or less extensive repairs are required on an average after 70, 60, 45, 40, and 60 charges respectively, or say an average of 56 charges.

Practice varies much as to the mode of conducting these repairs. There are very important advantages in the system worked by Mr. Richards, of performing them with liquid lime-tar without cooling the vessel. This enables a badly worn lining to be made as good as new in less than fifteen hours, as a maximum, after the last blow. In some works, when a vessel is badly worn, the whole lining is knocked out and replaced; in most, however, the more economical mode of merely renewing the worn portion is employed, and an absolutely new lining is only put in after many months' working.

Not less important than the durability of linings is that of durability of bottoms. The average number of blows per bottom, as reported by ten works, is as follows: 8½, 21, 13, 14, 18, 12, 14, 15, 12, or an average of over 14 blows. In nearly all cases only pin-bottoms are used, so no tuyeres are replaced. The average would be higher if only the results of the past few weeks were taken. In many cases lime bottoms have run for 24 heats, and even over. The average duration of silica bottoms in England would appear to be under 11 blows, the best average being 14 and the lowest 9, besides replacements of tuyeres. Perhaps, however, the best criterion of the relative durability of basic lining material is afforded by the consumption of refractory basic materials for linings and bottoms per ton of steel produced. Unfortunately, reliable figures on this head are not always obtainable. The following represents the total consumption of basic refractory material (in the only works in which trustworthy account seems to be kept), in kilogrammes per thousand kilos. (one ton) of steel: 45, about 40, 38, 70, or a mean of 48 kilos., or rather under 1 cwt. per ton of steel. The 70 kilos. being in a new works not yet in regular work, it may be assumed that 48 kilos. is more than the actual mean, which is probably under 45 kilos. The consumption of ganister and tuyeres in the hematite process is probably about 30 kilos. The consumption of coal in the burning and shrinking of the calcareous refractory lining and bottom material varies very greatly, being now considerably less than in early practice. Thus, for the production of a ton of prepared refractory basic material, the consumption of coal varies between 17 cwt. and 3½ tons at different works, being 2 tons, 3 tons, 3½ tons, 17 cwt., 20 cwt., and 22 cwt. At three works, where the cupola mode of preparation is adopted, the consumption of coke is 21 cwt., 18 cwt., and 15 cwt. With good firing arrangements and regular work, there seems no difficulty in obtaining a ton of lining material with a consumption of considerably less than 24 cwt. of coal, or say 16 cwt. of coke.

At the average cost of limestone and coal or coke in English steel-making districts, the maximum average cost of basic lining material would be considerably below 2/ a ton; in some, it would be below 20/. The cost has been reduced already very much below the first figure in several existing works. Taking as an average 1 cwt. of basic material (including tar) per ton of steel made, the cost of material would be about 1/8 per ton of steel produced. Should it prove practicable to commercially produce magnesia at a very low figure, this may prove a useful material. The consumption of lime for additions varies between 13½ and 17½ per cent. on the weight of the pig used—say, an average of rather over 15 per cent. on the steel, or 3 cwt. per ton. The result of recent trials makes it probable that a little over 2 cwt. may perhaps prove sufficient. The slag produced in conversion is, in all new works, allowed to run direct into a slag bogey, so that there is no handling of slag at all. The composition of the slag, *i. e.*, its content of iron, manganese, lime, magnesia and phosphorus, is such as to give it in the blast furnace rather more than the value of an equal weight of limestone.

The loss of metal, including remelting (when practiced), varies considerably, being in all cases in excess of the loss obtained in the hematite process. The absolute loss reported from eleven works is 14, 13, 16½, 16, 16, 15, 15½, 11, 13½, 17 and 19 per cent. respectively, or an average of 15 per cent. There is, however, reason to believe that the 17 and 19 per cent. losses reported are abnormal, and the latter, reported by a new works for the first few months' working, is probably incorrect. The loss from shots of metal being entangled in a somewhat cold slag is always exceptionally large at the commencement, owing to slow, and therefore cold, working, as well as to bad cupola working. The average loss in conversion in English hematite practice is probably about 12 per cent. The duration of the blow, including the afterblow, varies from 13 to 25 minutes, averaging about 18 minutes. This does not include sampling, which, when practiced, usually occupies 3 or 4 minutes more. The sampling period would in America be doubtless utilized in blowing the second vessel. Blast power sufficient to finish a blow in about 15 minutes is desirable. The average pig used in various works varies in composition as follows: White iron is generally preferred; at Eston, however, Mr. Richards blows white, gray and mottled indifferently, all direct from the furnace. Only direct working is carried on at Eston and Creusot, and mixed direct and cupola working at two other works.

	Phosphorus.	Silicon	Manganese.	Sulphur.
1	1.75	1.2	.35	.10 to .2
2	2.00	1.0	1.00	.....
3	2	.5	2.00	.....
4	2.5	.5	1.7	.....
5	2.5	.....	1.00	.....
6	2	.50	.8	.....
7	2.2	.80	1.2	.....
8	1.90	.50	2.0	.....
9	2.	.70	1.0	.....
10.	2.	1.1	1.7	.....
11	1.9	1.00	1.9	.....

All these varieties, which are the average of the charges used at the several works, work well, but considerably wider limits of composition are actually employed.

As to the quality of the steel produced, the rapid extension of its employment for every purpose for which Bessemer steel has ever been used (excepting, perhaps, the manufacture of Bessemer tool steel) is the best evidence.

That dephosphorized steel is even superior to hematite steel for certain purposes, such as boiler and other plates and wire, is now pretty well agreed. The total number of converters at present regularly working on phosphoric iron is 36, of which, however, 8 or 9 are of less than four tons' capacity. Thirty more converters, specially designed for the process, are now under construction. Several Siemens furnaces have been in regular work for some time, but details of their operations must be reserved for the present.

If no formal acknowledgment is made by name of the many able co-workers in Germany, Austria, France, Belgium and England, who have contributed so largely to the development of practical dephosphorization, and to furnish materials for this note, it is only because acknowledgments are due to so many that it would be invidious to particularize a few. As, however, Mr. Richards is absent, it may be permissible to renew the expression of a feeling of deep indebtedness to him—a feeling in which all interested in dephosphorizing progress will certainly join.

* A paper by Sidney Gilchrist Thomas and Percy Carlyle Gilchrist, read at the London meeting of the Iron and Steel Institute.

Patents in Turkey and Liberia.—General patent laws have been lately passed and promulgated in Turkey and Liberia, in which countries inventors may now, for the first time, secure their new inventions. The Turkish patent law is substantially a copy of the French and German systems. Any person may take a patent on deposit of drawings and specifications. Longest term of the patent 15 years, annual tax about £4. The invention must be worked within two years from the date of the patent. The penalties for infringement and the proceedings are the same as in European countries. In Liberia the patentee must be the inventor, or must have lawfully acquired the invention from the inventor. Drawings and specifications must be furnished. The government fee is about £10. 10/. The proceedings are much the same as in taking an American patent. The invention must be worked within three years after the grant of the patent.

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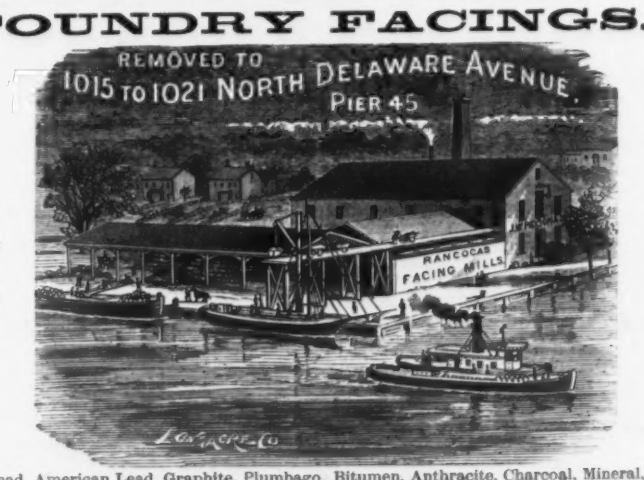
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A New Steel Plant.

The Juniata Iron Works, Pittsburgh, Messrs. Shoenberger & Co., which have been known since 1824 as one of that largest iron-producing establishments in that city, have recently added an extensive steel plant for the manufacture of open-hearth steel plates, blooms and ingots. Their success in the manufacture of steel boiler and fire-box plates has been so gratifying that they have been induced to erect a new mill for rolling them, which is by far the largest in Pittsburgh, and equal in size to the largest in the country. The mill is now in place, and will probably be running inside of a month. It is what is known as a three-high mill, with top and bottom rolls each 31 inches in diameter and the middle roll 20 inches in diameter, each roll being 112 inches long on its face. The large rolls weigh each about 15 tons, and the small roll 7 tons. The whole mill, including rolls, housings, pinions, bed-plates, &c., was built by Messrs. A. Garrison & Co., of Pittsburgh, and is considered one of their masterpieces. It is expected that the mill will roll plates over 100 inches wide and weighing as much as 4000 pounds. To shear these plates an immense shear is being built, which will shear 100 inches long at each stroke. It will weigh 67 tons.

This is the second time that Messrs. Shoenberger & Co. have put in the largest train of rolls in Pittsburgh. The other time was in 1856, when they erected a set of two-high rolls 52 inches long and 22 inches diameter. In that day such rolls were considered enormous. At that date the firm enjoyed an enviable reputation for their Juniata iron boiler plate, they being the original owners of the trade name "Juniata." Much of that iron made over 30 years ago is still in service in steam boilers. After the war, on account of the manufacture by some makers of iron that was unsuitable for boilers, with serious risk to life, and the sale of large quantities of it at low prices, the firm abandoned the manufacture of iron boiler plate rather than meet such competition.

In 1878, recognizing the fact that steel was being substituted for iron for a large number of purposes, and that it was far superior to even the best iron for steam boiler plates, they began the erection of a 10-ton Siemens-Martin (or open-hearth) furnace. The product was at first rolled into blooms and billets and sold as such for a variety of uses, about 400 tons being made for the great steel bridge over the Missouri River at Plattsmouth, Neb. In the beginning of 1880 they made the steel boiler plates for the new boilers for the Pittsburgh Exposition building, which were built by D. W. C. Carroll & Co. A vast number of tests of this steel convinced the firm that they had already reached the same degree of perfection in making steel boiler plate which they attained years ago in the Juniata iron plates, and they resolved to keep their product always at the same high standard, and to increase their facilities for making it. Up to this time all their steel plates have been rolled on a two-high train, with one set of rolls 66 inches long and 24 inches diameter. In Pittsburgh boilers made of their steel are in use in the works of the Lucy Furnace Company, Isabella Furnace Company, Wilson, Walker & Co., Spang, Chalfant & Co., and Oliver Bros. & Phillips, as well as in the tow boats on the Ohio River, Boaz, Clipper, Diamond and others. One of the orders they have recently filled was for over 200 tons for 20 large boilers of about 11 tons each for the Edgar Thomson Steel Company. These boilers have just been completed by Messrs. D. W. C. Carroll & Co. It has been erroneously reported that the steel was made by another firm. Before purchasing, the E. T. Steel Works made chemical and other tests of several prominent makes of steel plates, and awarded the contract to Shoenberger & Co. simply on the ground of superior quality. The rivets were also made of the same quality of steel, and were so soft that on being heated, while hot, plunged in water and then nicked with a sharp chisel, could be bent around double without breaking. A second open-hearth furnace is now in operation, and the capacity of the steel works is now 40 tons of steel per day. The firm, owning their own blast furnaces, have entire control of their raw material, and can therefore insure that their products shall always be of the same quality.

The Life of a Car Wheel.—When the ordinary chilled car wheels were the only kind in use, 45,000 miles was considered an exceptionally good record for a wheel, while the great majority would run from 35,000 to 40,000 miles only. With the present steel-tired wheel 300,000 miles' wear is not unusual, and wheels have even been known to live through 600,000 miles' service. A prominent New England railroad has about 1900 of these wheels in use, the average life of which is 122,000 miles, many of them being new. From the number, 666 wheels which had been longest in use were selected, and the record showed an average mileage of 215,578. Among the number were 126 which had run over 250,000 miles, and 35 had a record of over 300,000 miles, while two had attained 490,915 miles each. It may not be generally known that railroads keep a record of every wheel in use, but such is the fact. Every wheel is numbered, and its life is traced by its daily service. The employees of the railroad are required to report the distance run at the end of each trip, and a record is made of the mileage of each wheel. Regarding the comparative cost of chilled and paper wheels, it may be said that while the price of the latter is considerably higher than that of the former, longer wear more than compensates for the difference. The ordinary chilled 33-inch wheel costs from $13 to $14, and the steel-tired wheel of the same size about $55, while the 33-inch paper wheel costs about $75.

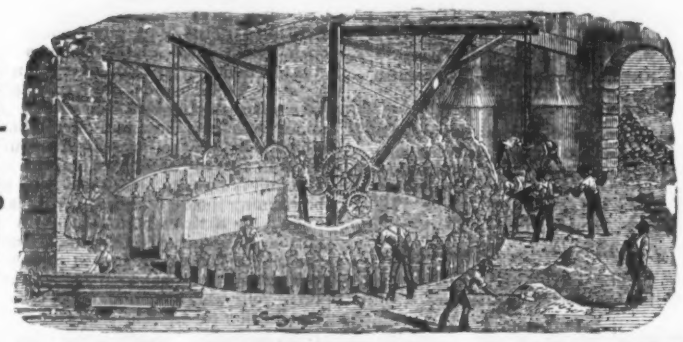
The Iron Wire, Wire Rope and Fencing Company, of Westminster, England, have just completed the execution of a very large contract for over 254 miles of wire fencing for the South Australian government to the value of nearly £15,500.

The quantity of steel rails used in repairs on the New York Central and Hudson River Railroad during 1880 was 6355 tons.

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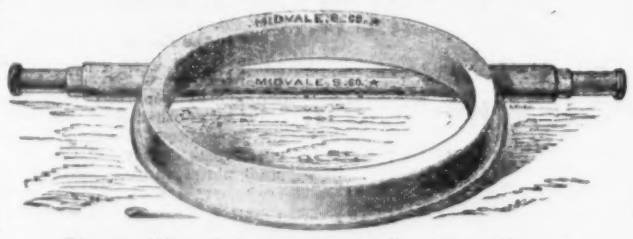
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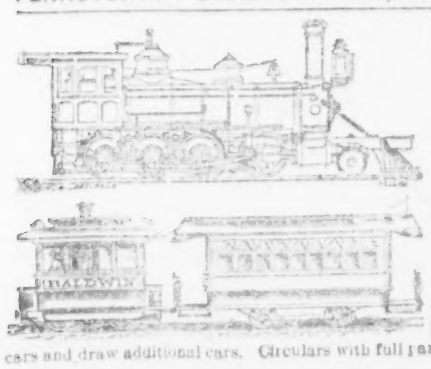
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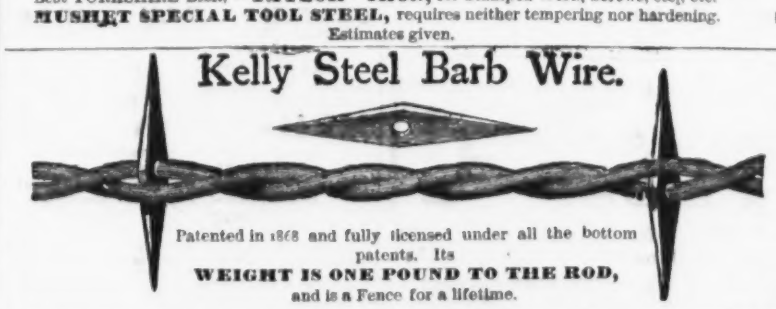
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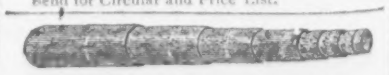
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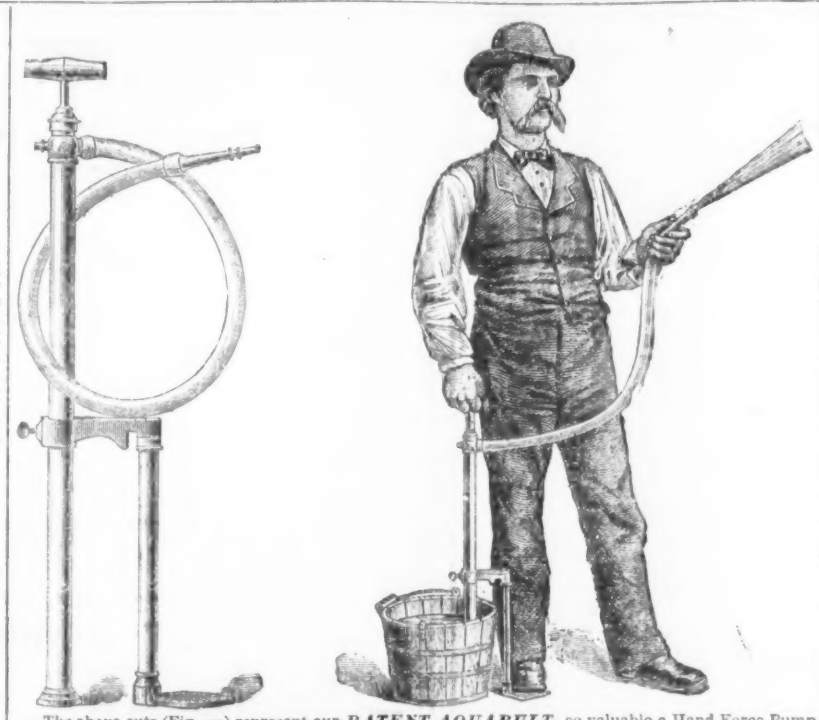
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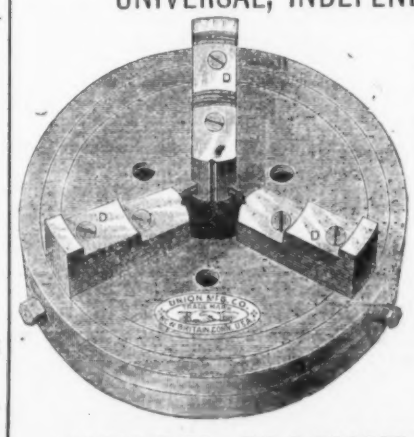


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Mag. Oxide of Iron	75.65	Metallic Iron	53.42
Protoxide of Iron	.83	Metallic Manganese	.06
Manganese Oxide	.09	Phosphorus	.16
Alumina	4.47		
Lime	1.52		
Magnesia	.07		
Silica	14.89		
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The Chemical Reactions in the Bessemer Process, the Charge Containing but a Small Percentage of Manganese.

BY CHARLES F. KING, NEWPORT, R. I.

[The following paper, an abstract of which appeared in *The Iron Age* after its presentation to the American Institute of Mining Engineers, has since been revised and added to by its author, and in its present shape now appears for the first time.]

The only investigations on record of the reactions occurring during the Bessemer blow are of charges containing a large percentage of manganese, with the exception of two partial analyses by Snelus and Barker of the English method, where a low percentage of manganese was used. They do not give the analysis of the spiegel, nor do they report any graphitic carbon after the first stage of the process. Both report only traces of manganese after the first stage until the addition of spiegel. The slags corresponding to the samples of metal were not analyzed.

The samples for the following analyses made by me were taken at the Bethlehem Iron Company's works, Bethlehem, Pa., on November 13, 1879. The blow lasted 18 minutes. The converter had 12 tuyeres, each with 12 holes of 3/8 inch diameter. The number of revolutions of blowing engine 2 minutes after start was 38 per minute with a pressure of 28½ pounds; 12 minutes after start, 43 per minute, pressure of 23½ pounds; and 15 minutes after start, 42 per minute.

Eight samples of metal were taken, namely, one of the pig charged, three during the blow, one at the end of the blow, one of the spiegel, one of the final product and one of the scrap charged before the addition of metal to the converter. Five corresponding samples of slag were also taken.

The samples of metal were cast in small ingots, and borings were taken from different parts of these ingots by drilling, great care being taken that they were not much heated while being drilled. The slags were dumped at once from the small sampling ladle into a can of water, so as to cool rapidly, and they were then dried in an air bath. The sampling was done with care, particles of ganister and shots of metal being separated from the slag.

The elements to which my attention was especially directed were graphitic and combined carbon, manganese and silicon. My results are similar to those obtained by others where the charges are manganiferous.

METAL.

1. *Carbon.*—During the first 8 minutes the total carbon diminishes only 9.30 per cent. of its original percentage. The carbon in the pig iron, on cooling, is for the greater part set free by the presence of silicon as graphite, but after the silicon is oxidized (at the end of the 8 minutes) the carbon remains in the combined form. The slight loss is due to the fact that carbon has less chemical affinity for oxygen than have silicon and manganese below a certain temperature, and above this the affinity of carbon increases rapidly. While, therefore, the silicon and manganese oxidize more readily than carbon at temperatures about the melting point of pig iron, the combustion of these elements raises the temperature of the bath until the carbon begins to burn. This characterizes the first period.

At the end of 15 minutes the loss in carbon is 64.783 per cent. of the original percentage of total carbon. In the following 2 minutes the loss becomes 94.168 per cent. of the original amount, and at the end of blow, or 18 minutes, it is 99.04 per cent. of the original amount. The loss after addition of spiegel is 92.29 per cent. of the total amount of carbon added in the charge and spiegel.

The second period is distinguished by an elevated temperature, causing the rapid elimination of the carbon by oxidation, the resulting product being chiefly CO with more or less CO_2.

The rate of loss of carbon is greater during the last two-ninths of the second period, or between 15 and 17 minutes, than at any other part of the blow, but small percentages of both graphitic and combined carbon exist in the bath until the end of the process.

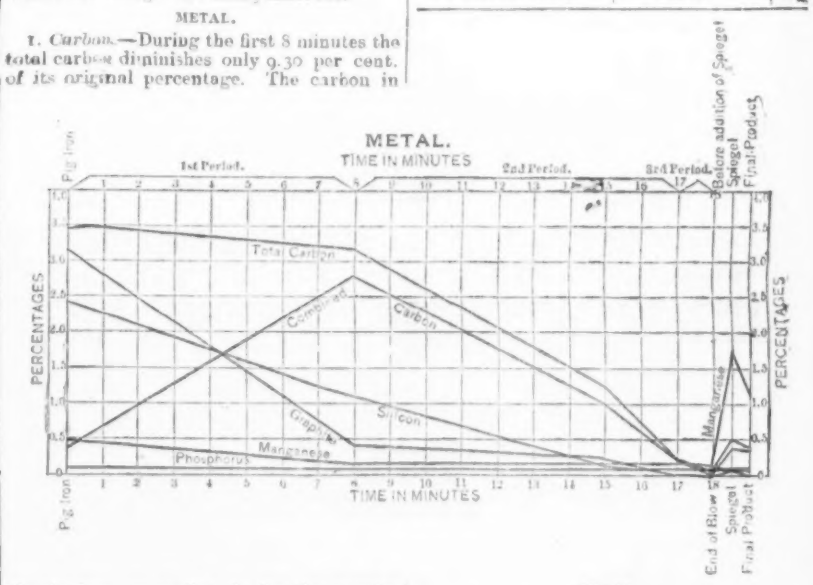
According to Kessler, who examined the products of conversions at the Osnabrück works, there was a slight increase in the percentage of carbon, in one case at the end of 4 minutes, and then a slight decrease at the end of 9 minutes, when it differed only slightly from the original amount. From this time on it decreased rapidly. In another experiment the carbon increased slightly to the end of 9 minutes, and then decreased rapidly, the blow lasting 20 minutes.

The only way to account for this gain is in the decrease of the manganese and silicon, which would tend to increase the relative percentage of the other ingredients of the bath.

2. *Silicon* commences to oxidize at the beginning of the blow to SiO_2, and the reaction continues until the end. The loss is 54.60 per cent. of the original amount at the end of 8 minutes, 95.504 per cent. in 15 minutes, 97.61 per cent. in 17 minutes, and 98.33 per cent. in 18 minutes, or the end of the blow. The loss after addition of spiegel is 97.56 per cent of the total amount of silicon of charge and spiegel. The greatest rate of loss is during the first period, or eight minutes of the blow.

3. *Manganese* is oxidized to the extent of 69.46 per cent. of the original amount present at the end of the first period, or 8 minutes: 72.94 per cent. in 15 minutes; 73.753 per cent. in 17 minutes, and 79.53 per cent. in 18 minutes, or the end of the blow. After the addition of spiegel the loss is 46.904 of the original percentage, plus the manganese added in the spiegel. The greatest rate of loss of manganese occurs during the first period, or 8 minutes. In the accompanying tables and diagrams I give the results of the analysis in convenient form for inspection:

No. of Sample.	Time.	Specific gravity of steel fully	Total carbon	Graphite.	Combined carbon	Silicon	Manganese	Phosphorus
I.	Metal charged.	6.856	3.543	1.650	1.893	3.112	0.316	0.408	0.085
II.	Eight minutes after start.	7.487	3.230	1.150	2.080	1.455	0.475	0.406	0.085
III.	Fifteen minutes after start.	7.547	1.150	0.000	1.150	0.025	0.225	0.406	0.085
IV.	Seventeen minutes after start.	7.514	0.947	0.000	0.947	0.000	0.225	0.406	0.085
V.	Eighteen minutes after start.	7.496	0.866	0.000	0.866	0.000	0.225	0.406	0.085
VI.	Spiegel.	7.496	4.413	0.000	4.413	4.500	3.000	0.406	0.085
VII.	Final product.	7.496	0.866	0.000	0.866	0.000	0.225	0.406	0.085
VIII.	Scrap.	7.514	1.150	0.000	1.150	0.025	0.225	0.406	0.085
VI. A.	Spiegel reduced to unit per cent. of charge.		3.543	1.650	1.893	3.112	0.316	0.408	0.085



SLAGS.

1. The silica increased from 62.64 per cent. to 75.63 per cent. from the eighth minute to the end of the seventeenth minute, when it suddenly fell to 61.29 per cent. at the end of the blow, and again increased to 64.15 per cent after the addition of spiegel.

Since we find that the percentage of silicon is also diminished in the metal at the same time (from 17 to 18 minutes), this large decrease of 14.34 per cent. of silica must be referred to the oxidation of the iron to FeO, thus decreasing the relative percentage of silica. As will be seen from the accompanying diagram, the oxide of iron increases from nothing to 13.5 per cent.

By carefully comparing other analyses I find that the same reactions take place. This period of oxidation of the iron, from the seventeenth to the eighteenth minute, is termed the third or last period of the blow.

2. The oxides of manganese and iron decrease regularly in amount from the eighth to the seventeenth minute of the blow, while during the next minute the manganese loses only 0.1 per cent., and the iron increases rapidly. Since the manganese in the metal is also diminished during this minute, the small relative loss shown must be owing to the increase of the amount of slag. Some of the manganese eliminated from the metal may not go into the slag, but be carried off in the fumes.

The iron exists in the slags, both combined as ferrous oxide and as shots of metal mechanically entangled. The amount of shot extracted with a magnet from the sample slag at the end of 8 minutes was 33.7 per cent.; from that at the end of 15 minutes, 38.19 per cent.; from that at the end of 17 minutes, 24.37 per cent.; from that at the end of 18 minutes, 17.8 per cent.; and after addition of spiegel it was 14.13 per cent. of the total weight of slag. The iron, determined by analysis after removal of the shot, and calculated to the unit per cent. of the slag and shot extracted, was 7.967 per cent. at the end of 8 minutes, 5.39 per cent. at the end of 15 minutes, 5.82 per cent. at the end of 17 minutes, 10.59 per cent. at the end of 18 minutes, and after addition of spiegel it was only 11.36 per cent.

This gives the total percentage of metallic iron in slag, at the end of 8 minutes, 41.69 per cent.; at the end of 15 minutes, 43.55 per cent.; at the end of 17 minutes, 30.19 per cent.; at the end blow, 30.69 per cent.; and after addition of spiegel, 25.56 per cent

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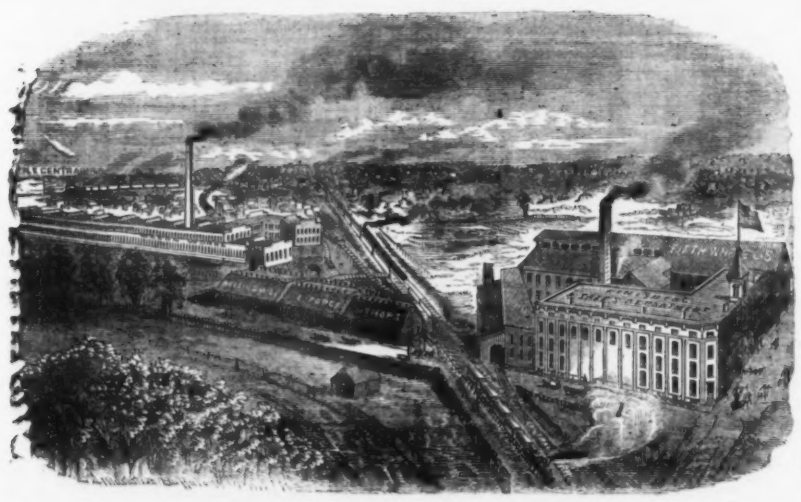
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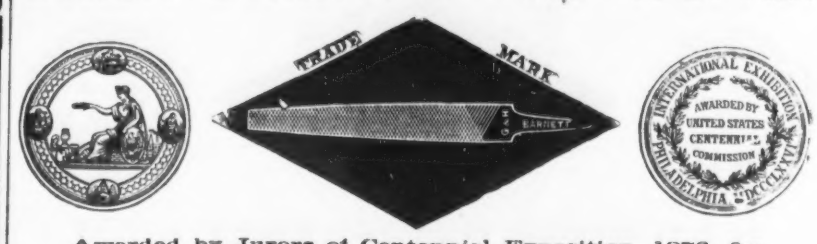
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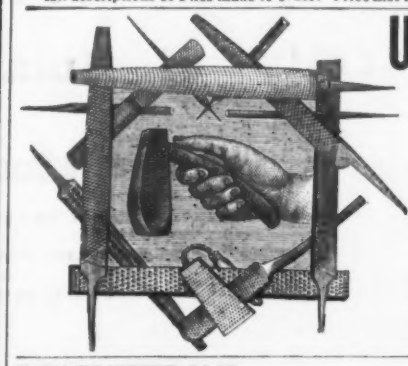
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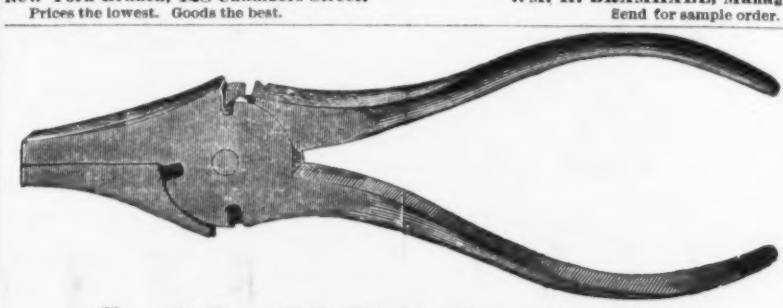
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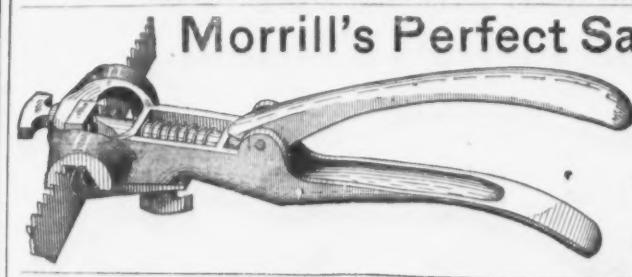


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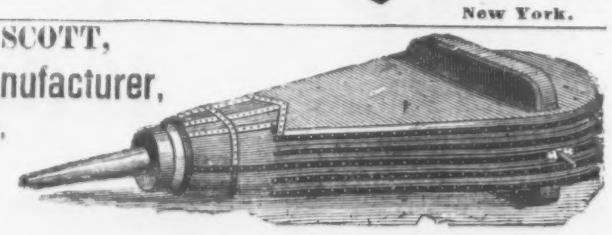
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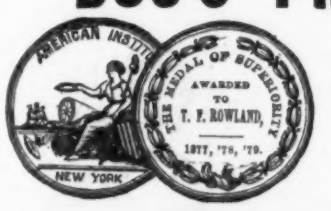
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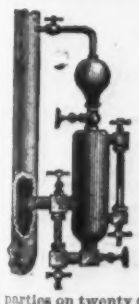
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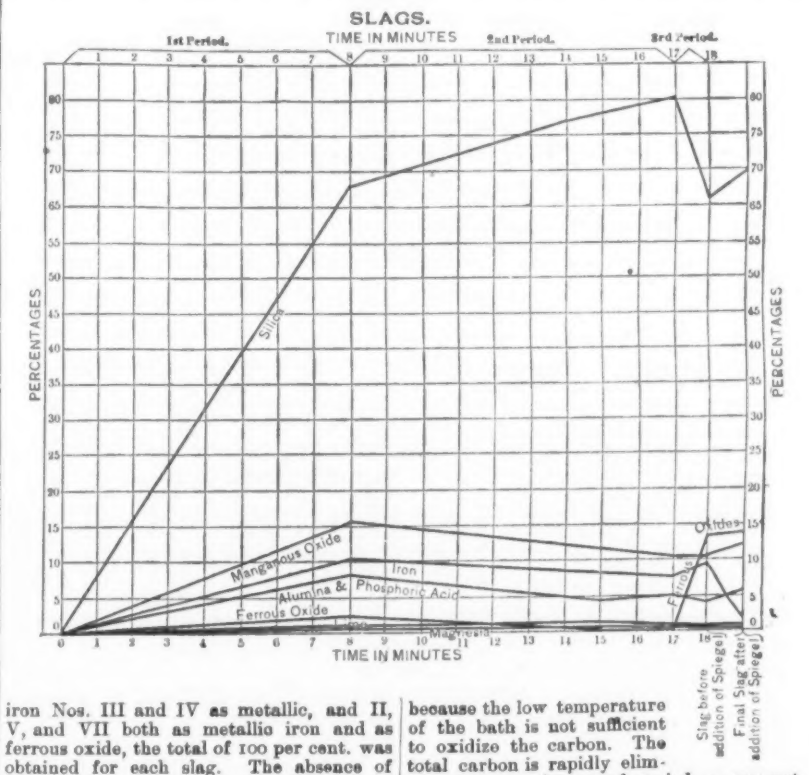
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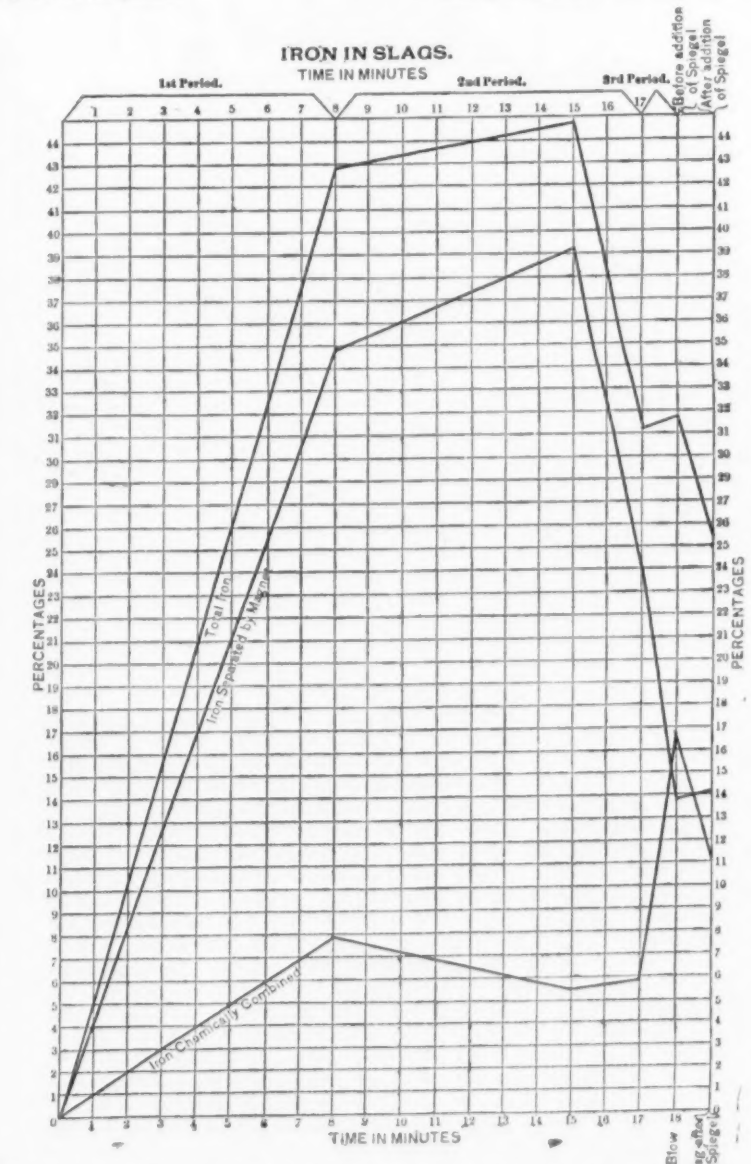
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After extracting all the iron possible with a magnet from the samples of slag, I found that the sum of the analyses, with all iron calculated as ferrous oxide, was as follows: 103, 102.5, 103, 102.5 and 100.68 per cent. Convincing myself that the analytical work was not at fault, I then tested the samples with a stronger magnet, and found still more metallic iron, and by calculating the iron Nos. III and IV as metallic, and II, V, and VII both as metallic iron and as ferrous oxide, the total of 100 per cent. was obtained for each slag. The absence of ferrous oxide from slags Nos. III and IV may be explained by the reducing action exerted by the carbonic oxide which is rapidly evolved from the bath of metal during the second period.



2. It is due to the presence of silicon that graphitic carbon is set free in the metal on cooling, and it is in proportion to the elimination, or absence, of the silicon that the carbon remains chemically combined when cooled. During the first period of the blow the total carbon is diminished very little, because the low temperature of the bath is not sufficient to oxidize the carbon. The total carbon is rapidly eliminated during the second period, on account of the increased temperature of the bath of metal, caused by the rapid oxidation of the silicon and man-ganese.

3. Silicon is rapidly oxidized in the metal during the first period of the blow, at the conclusion of which it has nearly all oxidized and combined with the slag.



The variations in amount of the alumina, lime and magnesia are slight and of no particular significance, as they come almost exclusively from the converter lining.

The results of the analyses of the slags are here given in tabular form:

ANALYSES OF SLAGS.

No. of sample.....	II.	III.	IV.	V.	VII.
Time.....	Eight minutes after start.	Fifteen minutes after start.	Seventeen min. after start.	Eighteen min. after start.	After addition of spiegel.
Spec. grav. (powdered sample)	2.979	2.282	2.411	2.937	2.770
Silica	62.656	73.214	75.604	61.293	64.143
	62.641	73.260	75.668	61.300	64.165
Alumina and phosph'c acid	7.984	4.512	5.203	4.317	5.662
	7.985	4.515	5.186	4.267	5.761
Ferrous oxide	1.966	none	none	13.506	14.007
	1.890			13.446	13.892
Mang. oxide	15.789	11.839	10.922	10.863	12.813
	15.773	11.824	10.921	10.787	12.807
Lime	0.659	1.110	0.969	0.747	0.745
	0.653				0.740
Magnesia	0.518	0.641	0.399	0.288	0.244
			0.360		0.234
Metallic iron	10.508	8.724	7.715	9.086	2.387
	10.540	8.712	7.693	9.165	2.402

The conclusions to be drawn from the above analyses are:

1. Phosphorus is not eliminated where a silicious lining is used, but the proportion is

4. Manganese decreases rapidly in the metal during the first period, and oxidizes more gradually during the remainder of the blow.

5. By the addition of the spiegel, the manganese, carbon and silicon are increased in the metal, and the iron in the slag is decreased.

6. The final slag carries the silicon and manganese of the charge, and contains 25.56 per cent. of iron.

7. The first period, or eight minutes, is characterized by a low temperature, during which the silicon and manganese are oxidized; the second period of nine minutes, or "boil," is marked by a high temperature, during which the carbon is oxidized rapidly, and the third period, or last minute of blow, by the rapid oxidation of the iron.

APPENDIX.—REMARKS ON INGOTS.

I.—Two castings were taken of I, or pig iron; they were sound, not any drill-holes in the one in which the specific gravity was determined. Weight of ingot used for specific gravity was 1641 grams.

II.—One casting was taken of II; it chilled, and was sound in the part used for specific gravity determination. Weight, 430.5 grams.

III.—One casting was taken of III; it had

RUSSELL & ERWIN MANUFACTURING COMPANY,

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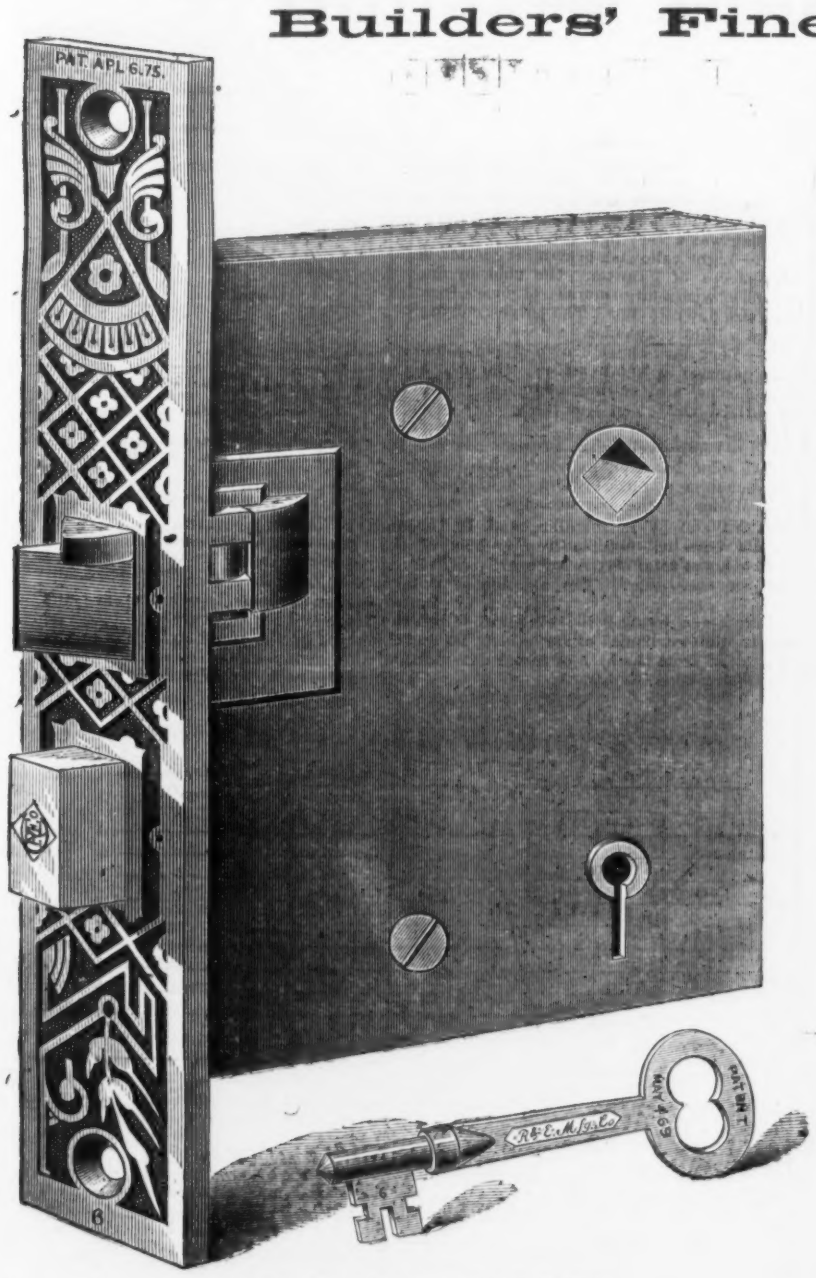
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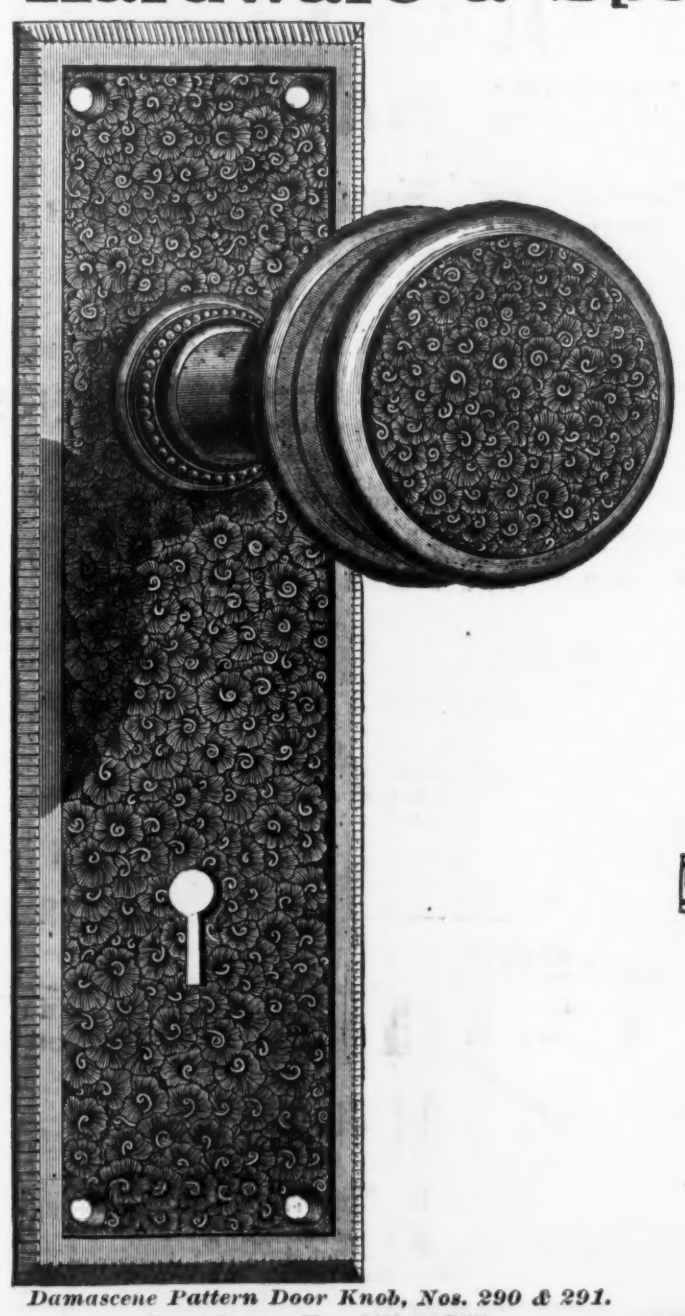
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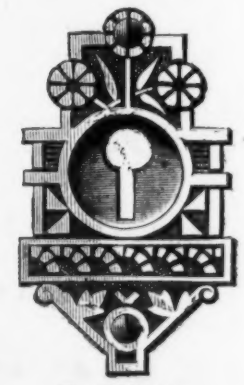
Damascene Pattern Door Knob, Nos. 290 & 291. Escutcheons, Nos. 250 to 257.



Japanese Pattern Door Knob, Nos. 960 and 970.



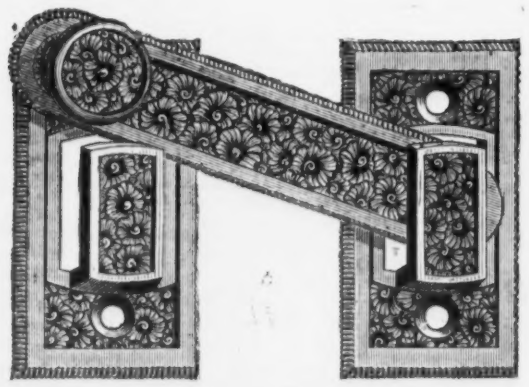
Escutcheon, No. 92.



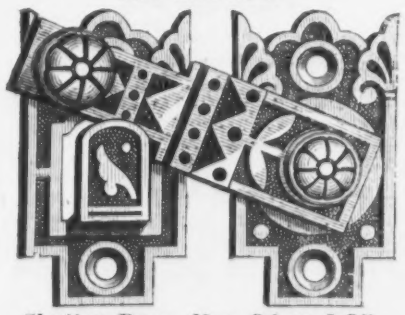
Escutcheon, No. 94.



Finger Plate, No. 18.



Damascene Pattern Shutter Bars, Nos. 250 and 251.



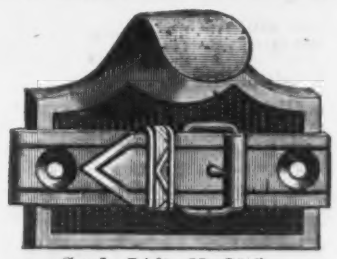
Shutter Bars, Nos. 34 and 35.



Damascene Sash Lift, No. 254.



Door Knob, Nos. 929 and 939.



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Japanese Pattern Butt, No. 17. 3½ x 3½ and 4 x 4.



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a few small blow-holes, also three drill-holes when the specific gravity was taken. Weight, 1354 grams.

IV.—Two castings were taken of IV; they were sound, but had three drill-holes when the specific gravity was taken. Weight, 784.5 grams.

V.—One casting was taken of V; it was an unsound casting, and had six drill-holes when its specific gravity was taken, which did not seriously interfere with the determination. Weight, 945.5 grams.

VI.—One casting was taken of VI; it had a small blow-hole, not any drill-holes. Weight, 745.5 grams.

VII.—One casting was taken of VII; it had a few small blow-holes in one end and six drill-holes when its specific gravity was taken. Weight, 1622.5 grams.

VIII.—Five small scraps were taken from bloom ends, and they contained 16 small drill-holes when their specific gravity was taken. Weight of scraps was 501.5 grams.

Note.—Specific gravity was taken of both ingots and pulverized metal.

REMARKS ON SLAGS.

II.—Dark bluish brown. It contained a very little ganister, and the shot was mostly in fine particles, with a few larger pieces about the size of a bean. The color of the pulverized slag was a dark gray.

III.—Very light yellowish brown. It contained some ganister in quite small pieces, and the shot mostly in fine particles, with a few of bean size. The color of the pulverized slag was a very light gray.

IV.—Light yellowish brown. It contained large pieces of ganister; the shot in fine particles, with a large number of pieces from bean size down to dust. The pulverized slag was of a light gray color.

V.—Very dark bluish brown. It contained some ganister in small pieces; the shot in large pieces, also in fine particles. When pulverized the color was very dark iron gray.

VII.—Light yellowish brown. It contained some ganister in small pieces, and the shot in large pieces; also, in fine particles. Color of the pulverized slag was a light gray.

Note 1.—The metallic iron was removed with a horseshoe magnet, and the ganister was separated by the aid of a magnifying lens.

Note 2.—The slag used in specific gravity determinations was powdered.

CHARGES OF BLAST FURNACES ON NOV. 13, 1879.*

Furnaces Nos. 1 and 2.

		Pounds.
Coal		2,000
Ore	Lehigh Mountain, Pa. Limonite	600
	African, Bona. Brown hematite	600
	Crown Point, N. Y. Magnetite	450
	West End, N. J. Magnetite	300
	Irish, North of Ireland. Red hematite	150
	Elba, Specular	300
Limestone. Bethlehem Iron Co.'s, at South Bethlehem		1,100

No. 4.

Coke. Connellsville, Pa		250
Coal		1,750
Ore	Lehigh Mountain, Pa	650
	African, Bona	650
	Crown Point, N. Y	487
	West End, N. J	325
	Irish	162
	Elba	325
Limestone		1,200

No. 5.

Coke. Connellsville, Pa		250
Coal		1,750
Ore	Lehigh Mountain, Pa	1,700
	African, Bona	700
	Crown Point, N. Y	525
	Irish	175
	West End, N. J	350
	Elba	350
Limestone		1,200

New and Old Northampton Furnaces.

Coke, Connellsville, Pa		250
Coal		1,750
Ore	Lehigh Mountain, Pa	700
	African, Bona	700
	Crown Point, N. Y	350
	Staten Island	175
	West End, N. J	525
	Elba	175
	Marbela, Spain	175
Limestone		1,400

No. 7, or Bingen Furnace.

Coal		2,000
Ore	Lehigh Mountain, Pa	750
	African, Bona	300
	Spanish. Brown hematite	300
	Tilly Foster, N. Y	300
	Irish. Red hematite	150
	Elba	300
	Evans, N. J	300
Limestone		1,200

* It was impossible for me to obtain the identical charges of the blast furnaces that constituted the charge for the Bessemer converter analyzed by me on the 13th of November, so I give the following charges of the 13th November, which used the same ores and in about the same proportion as those required.

CHARGE OF THE BESSEMER CONVERTING VESSEL ON NOVEMBER 13, 1879, FROM WHICH THE SAMPLES WERE TAKEN (BLOW B. A., 1876).

	Pounds.
Charge Bethlehem Furnace No. 1	1,400
" " " No. 2	1,400
" " " No. 4	1,800
" " " No. 5	1,800
" Northampton Furnace, new	1,800
" " " old	560
" Robesonia pig iron	2,000
" Maryport pig iron	560
" Bingen Furnace or No. 7	3,000
" Old molds	600
" Total of pig iron	15,000
Spiegel, Bethlehem Furnace No. 3	400
" " " No. 6	150
" French (36 per cent. manganese)	600
" German (11 per cent. manganese)	550
" Total	1,700
Limestone	400
Coal	2,400
Total burden in spiegel furnace	4,500

Note.—Robesonia iron comes from the Cornwall mines, near Lebanon, Pa., and is produced from a good magnetic ore.

	Pounds.
Weight of heat in ladle	16,000
Scrap (bloom ends) added	800
Spiegel added	2,000
Ferromanganese	40
Total charge in Bessemer converter	18,840
Weight of ingots produced	16,720
Castings, say, 500 pounds after adding about 20 pounds of spiegel	480
Scrap, say	300
Total product	17,500

Note 1.—Loss of metal was 7.112 per cent. of the total charge.

Note 2.—Spiegel formed 10.61 per cent. of the total charge in the converter.

The Otis Tube Company, Cleveland, has been incorporated by W. L. Otis, Edward Lewis, B. F. Rouse, M. M. Murphy and L. L. Otis. Capital stock, $100,000. Works will be located on Hamilton street, at the C. & P. crossing.

METALLURGICAL NOTES.

LEDEBUR'S INVESTIGATION OF SLAGS.

The presence of magnesia in the limestone employed for fluxing iron in smelting influences the fusibility of the slag formed. The quantitative limits of this effect have, however, not received much attention as yet, and the following results connected with this subject are due to the investigations conducted by A. Ledebur. He experimented with various mixtures of fluxes, so arranged as to give slags of a definite composition. They were fused in charcoal-lined crucibles, with known quantities of cast iron, specially prepared for the purpose, containing some manganese and about 2.3 per cent. of sulphur. The materials used were: 1. A pure crystalline limestone, containing 2.1 per cent. of silica. 2. A dolomitic limestone, containing 11.1 per cent. of silica. 3. China clay. 4. Pure calcined magnesia. 5. Pure silica. Three series of experiments were made, the first with slags of bibasic silicates, the second of tribasic-quadri silicates, and the third of normal silicates. Each series contained six assays, two containing only lime, two with magnesia alone and two with dolomite; in all cases alumina was present in the constant proportion of one-fourth of the sum of the lime and magnesia. The sulphur contents of the buttons of metal and of the slags were determined in all cases where the metal was actually melted. The results were:

Number.	Description.	Sulphur in slag. Per cent.	Sulphur in metal. Per cent.
	I. BIBASIC SILICATES.		
1	Lime only, white and stony, with shots of metal, slightly graphitic	1.445	0.079
2	Magnesia only, blackish gray, with less iron than preceding, white	1.069	0.260
3	Lime and magnesia, gray porcellanic, with large iron shots, mottled on fracture	1.134	0.154
	II. TRIBASIC-QUADRI SILICATES.		
4	Lime only, bluish white porcellanic, with few shots of iron, penetrated with plates of graphite	1.235	0.038
5	Magnesia only, could not be melted		
6	Lime and magnesia, greenish white crystalline, white	1.265	0.109
	III. NORMAL SILICATES.		
7	Lime only, brownish vesicular, white shots	0.681	0.357
8	Magnesia only, bright green stony, white	0.290	0.391
9	Lime and magnesia, olive green glassy, white	0.801	0.408

The question of the probable condition of sulphur in iron furnace slags, as to whether it is or is not combined with calcium or manganese, has received some attention, but without any decided results. The blue color of some slags obtained from charcoal furnaces is, in all probability, due to sulphide of manganese, since it appears only when manganese is present, and the lower oxide of that metal does not communicate a blue color to vitreous fluxes. Two experiments made by passing chlorine, perfectly dried and freed from hydrochloric acid, at a strong red heat over slags from the puddling and Bessemer processes, appeared to bear out this view, as the whole of the sulphur was volatilized, together with some manganese as chloride. A possible source of error may, however, here be pointed out, indicated by the circumstance that the whole of the ferrous oxide in wood slags is, by this treatment, converted into ferric oxide and ferric chloride (the latter volatilized), and it is quite possible that the lower oxide of manganese may behave similarly. Attempts to obtain metallic manganese and sulphide of calcium by heating sulphide of manganese with carbon and materials to give a very basic calcareous slag, and the reverse experiment of heating 85 per cent. manganese metal with gypsum and carbon failed, because it was impossible to bring such mixtures into a state of fusion.

UTILIZATION OF PHOSPHORIC SLAG FROM THE BASIC PROCESS.

In order to use phosphoric slags, and especially those obtained by the Basic process of treating phosphorus, Mr. Thomas suggests the following method: The slag is first introduced, while hot, into cold water to granulate it. The fragments are then reduced to a fine powder, metallic grains contained therein being removed by the use of a magnet. The powder so obtained is dissolved in hydrochloric acid contained in large tubs or vats; the insoluble silica which may be present is separated by the process of filtration and the clear solution obtained, which we may call solution A, is subjected to the treatment described below: 1. When the solution does not contain manganese to any appreciable extent, quicklime in the form of powder or in small pieces is added, until all the phosphoric acid is precipitated as phosphate of iron, which is in some instances mixed with phosphate of magnesia. The liquid is then filtered, giving what may be designated as solution B. The precipitate is dried and intimately mixed with sulphate of soda, in the proportion of about three equivalents of soda to one of phosphoric acid. To this mixture is added pulverized coal, coke or charcoal, in order to reduce the sulphate of soda, the whole mixture being subjected to a very high temperature in a reverberatory furnace. A strong current of air is at the same time injected through a nozzle, in order to agitate the mass after it has become softened, this current being kept up until all chemical action ceases and oxide of iron and phosphate of soda alone remain. In order to produce fusion, a small quantity of sodium chloride may be added in such a way as to cause the formation of sulphate of soda. The sulphuric and hydrochloric acids, as well as the chlorine gas which can disengage themselves, are gathered and may be used again. The mass produced by the fusion in the furnace is now removed therefrom and subjected to the action of a water bath until the phosphate of soda is completely dissolved, leaving commercial oxide of iron. The phosphate of soda solution may be evaporated to dryness, or, still better, the phosphoric acid may be precipitated as phosphate of lime by the addition of lime, while the sulphate of soda may be removed by crystallization. Instead of fusing the

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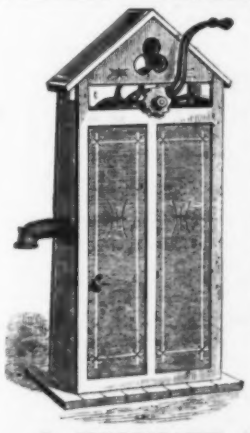
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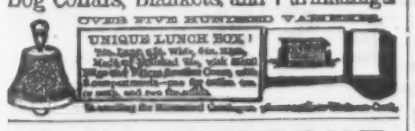
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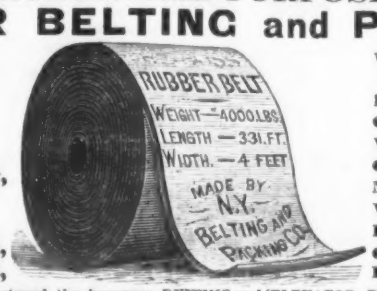


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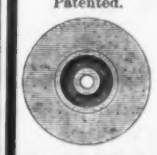
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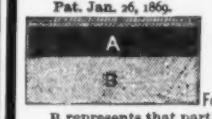
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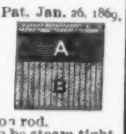
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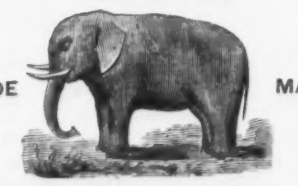
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phosphate of iron in connection with sulphate of soda, it could be fused with carbonate of soda, or boiled with a solution of caustic soda, all methods answering the purpose to obtain phosphate of soda. 2. When the slag contains a considerable quantity of manganese which it is desirable to recover, some peroxide of manganese is added to the acid solution A, in order to oxidize all the iron contained therein. A sufficient quantity of iron may be added, so as to form, with the phosphoric acid, a phosphate of the peroxide. The liquid is boiled until the phosphate of iron is precipitated, pulverized chalk or dolomite being added during the process of ebullition in order to nearly neutralize the liquid. The precipitate obtained is treated as above mentioned. After filtration the liquid is boiled with some ordinary quicklime, or with some lime containing magnesia. In the first case, oxide of manganese mixed with only a small quantity of ferric oxide is precipitated, while in the second case the precipitate is mixed equally with magnesia. This mixture of magnesia with the oxides of iron and manganese is utilized by adding to it a small quantity of fresh lime to precipitate a new quantity of oxide of manganese from a new solution. The magnesia contained in the mixture precipitates the oxide of manganese from the solution, while the oxide of manganese with which the magnesia had been mixed remains undissolved, and increases the quantity of the precipitate. One can also boil this solution, as well as solution B in the first case, with quicklime, in order to obtain magnesia completely free from lime; after filtering and cooling, the warm solution crystals of perchlorate of lime may be obtained.

SCIENTIFIC AND TECHNICAL.

At the royal colliery of Friederichsthal, near Saarbruecken, a press has been erected for the purpose of

TESTING WIRE ROPES

used for mining purposes. The cylinder of the press is supported by cast-iron standards, giving a clear vertical working space of about 1 meter between the fixed and movable clamps by which the test pieces are held. The latter is upon a crosshead parallel to a second one above the ram, the two being connected by side rods. The length of stroke and diameter of the ram are both 300 mm., and its effective surface is 707 square cm., which at the highest pressure of 200 atmospheres corresponds to a pull of 141.4 tons. The sides of the press cylinder are 100 mm., and the bottom 150 mm., thick; the side rods connecting the two crossheads are 90 mm. in diameter. The experiments described were made upon three ropes that had been laid aside at use. The first was a round steel rope of 28 mm. in diameter, with seven strands of seven wires each and a hempen core of 10 mm. diameter. The total section of the wires was 250 square mm., and the tensile strength when new was guaranteed to be 28.2 tons by the maker, and proved to be 31.8 tons on trial. As it had been exposed to the air for some time, it was considerably and rather unequally rusted. The second rope, also of round steel, was 29 mm. in diameter, with six strands each of eleven wires 1.65 mm., upon a core of seven (one of 1.65 mm. and six of 1.45 mm.); the whole having a hempen core of 12 mm. The total section, apart from the six thicker core wires, was 200 square mm., and the tensile strength 21.89 tons guaranteed, and 26.63 tons actual. This was much better preserved than the preceding one, and the results obtained are considered as more accurate. The third rope was a flat one of cast steel wire, 60 mm. broad and 13 mm. thick, made up of six round ropes, each having strands of six 1.45 mm. wires and a hempen core of 2 mm., the section of the metal being 238 square mm. When new, the tensile strength guaranteed was 25 tons. There being no means of applying the press to the lifting of heavy loads of known weights, the loss due to friction produced by the hydraulic packing leather could not be directly observed, and was therefore calculated by Reuleaux's formula:

$$\frac{F}{P} = \frac{1}{D}$$ where F is the friction of the ram, D, the diameter of the ram, and P, the load upon it.

Moreover, if p = pressure per square cm. = 1.033 observed gauge pressure in atmospheres; p^1 = weight of ram and attached moving parts; q = section of ram; s = effective strain on the rope;

$$P = q\,p\,F = \frac{p\,q}{D} - \frac{p^1}{D}$$

$$s = p\,q - p^1\left(\frac{p\,q}{D} - \frac{p^1}{D}\right) = \frac{D-1}{D}\,p\,q - \frac{D-1}{D}\,p^1 = \frac{D-1}{D}\,p\,q - C,$$ from which the following expression was obtained:

$$s = 727.75\,a - C,$$

giving the actual strain on the rope from the observed gauge pressure in atmospheres a. C is a constant whose average value varied with the weight of the moving parts from 1375 to 1435 kg. The object of the experiments was to determine the value of different methods in use for attaching ropes to the drawing cages. These were: 1. Baumann's method, in which the end of the rope is fixed in a conical box by three wedges, the train being uniformly distributed by a hard metal packing, whose surface is accurately molded to that of the rope. 2. Similar method, but without protecting casing between the rope and the faces of the wedges, which are rough and hardened. 3. The ends of the wire were untwisted so as to nearly fill the conical box, and secured by an annular wedge. 4. Like No. 3, with the end secured by a conical plug. 5. Similar to 3 and 4, the joints being made by running in lead, zinc, or hard composition metal. 6. End turned into a loop and secured by pairs of iron rings, driven home by blows upon an anvil; length of point, 700 mm. 7. Loop with ends secured by three clamps, with two bolts to each; length of joint, 500 mm. 8. Loop with three clamps, having four bolts to each; length of joint, 600 mm.

Fastening.	Breaking strain. Round rope of 28 mm. Tons.	Breaking strain. Round rope of 24 mm. Tons.	Breaking strain. Flat rope 60 × 13 mm. Tons.
Ronghened vice jaws	28.5—30.8	24.1—24.6	29.7
Clamp, No. I	27.7	24.1	.....
Clamp, No. II	23.3—25.5	22.6—23.4	28.1—30.3
Ring wedge, No. III	25.7—26.4	6.6—22.6	.....
Plug, No. IV	26.8—24.8	15.6—22.6	.....
Lead joint, No. V	12.1—16.1	12.1—18.3	5.2
Zinc joint, No. V	19.3—24.1	20.1—23.0	28.5—29.8
Hd. met. jnt., No. V	24.4—25.9	23.0—23.4	27.5
Loop, No. VI	10.2—11.3	16.6—17.9	.....
Loop, No. VII	13.7—27.7	13.8—24.9	24.8—29.5
Loop, No. VIII	15.3—27.7	15.3—23.7	29.1—30.2
Loop	19.7—27.7	.....	.....

The variations in the above figures are caused by the rope slipping in the holder before the actual breaking strain was reached. This was especially the case with the lead joint No. 5, where the soft metal was invariably compressed and the rope was pulled out of the joint. Better results were obtained with zinc and hard metal, but the individual differences show that the metal must be cast at a high temperature to make a proper joint, when the wire is likely to be overheated, whereby its tenacity is diminished. Fastening No. 1 gave the best results, the strength of the joint being almost equal to that of the rope. The method of securing an eye with rings driven on proved thoroughly worthless, as the rings invariably slipped at a low strain.

An Expanding Mandrel.—An expanding mandrel recently introduced consists of two parts, viz., a ribbed split sleeve and the mandrel proper. The sleeve, which is made of steel, is pierced with a tapering hole, and one end of the mandrel is turned to exactly fit this hole. The sleeve is then turned to the required diameter, preferably on the mandrel to which it belongs, after which the material is removed in such a way as to leave three narrow longitudinal bearings with equal depressed spaces between them. These depressions extend very nearly to the bore of the sleeve, leaving only sufficient metal to hold the bearings in position. The sleeve is cut apart through one of these depressions, leaving it free to contract or expand. In using this mandrel, the sleeve is placed in the hole, where, by lightly driving the mandrel into it, expansion will occur, and the three bearing surfaces will be forced into sufficient contact. The contrivance is simple in construction, can be readily and inexpensively made as required for use in a machine shop, and can also be advantageously manufactured and sold as a standard tool.

Minute Workmanship.—The Salem Museum, Massachusetts, has in its possession a cherry stone containing one dozen silver spoons. The stone is of the ordinary size, the spoons being so small that their shape and finish can be distinguished only by the microscope. This is the result of immense labor for no decidedly useful purpose, and there are numbers of other objects in existence the value of which may be said to be quite as indifferent. Thus, Dr. Oliver gives an account of a cherry stone on which were carved 124 heads, so distinctly that the naked eye could distinguish those belonging to popes and kings by their miters and crowns. A Nuremberg top maker inclosed in a cherry stone which was exhibited at the French Crystal Palace, a plan of Sebastopol, a railway station, and the "Messiah" of Klopstock. Pliny, too, mentions the fact that Homer's Iliad, with its 15,000 verses, was written in so small a space as to be contained in a nutshell. The greatest curiosity of all, however, was a copy of the Bible, written by one Peter Bales, a chancery clerk, in so small a book that it could be inclosed within the shell of an English walnut.

An important canal is being made near San Francisco, across Grand Island, in order to open a new channel for the Sacramento River. This canal will be 13 miles in length and 25 feet in depth. The dredging machine employed consists of a platform 101 feet long, carrying the dredging machinery, which consists of a long arm mounted on standards at one end of the platform; the endless chain on the arm carries 16 buckets, each of 1 ton capacity. The depth that can be dredged is 25 feet, and the material excavated can be raised to a hight of 39 feet, at which elevation it falls into a wrought-iron hopper. Connected to this hopper by a revolving joint is a wrought-iron pipe, 100 feet long, and about 3 feet in diameter. By means of the movable joint, the platform can be shifted within considerable limits without stopping work. The material excavated by the bucket, after a fall of 13 feet, is discharged upon the sides of the canal. The power required to drive this machine is 100 horse, and its capacity is 4000 cubic yards per day.

Some interesting experiments have been lately carried out in Leipsic with a cuirass made of a newly invented preparation of steel. The metal of the cuirass is only about 3-50ths of an inch thick, and is lined inside with a thin layer of wool. The cuirass itself is 14 inches wide and 10 inches high, being intended only to protect the heart and lungs, and weighs 2¼ pounds. Eleven rounds were fired at it at a distance of 175 yards from a Martini breech-loading rifle, and of eight bullets which struck the cuirass only two pierced the metal, while even these were completely flattened and remained in the woolen lining, so that a man wearing the cuirass would have been uninjured.

The Adalbert silver mine in Przibram (Bohemia) has now been excavated to a depth of 1032 meters, and is thus one of the deepest mines in the world. The heat at Przibram is so great that it is not possible to proceed further.

The Iron Age

AND

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Forty-sixth Page.—Boston Hardware and Metal Prices.

At the recent session of the Associated Chambers of Commerce of the United Kingdom, the subject of the bounties on French shipping was brought up and discussed on a resolution that read: "That the French system of bounties is unfair." The argument in favor of this was that it was opposed to fair trade, and that the effect of these bounties would be disastrous to British shipping. With all due deference to our English cousins, it does seem to us that they are in the condition of the boy who yelled to his father, "Father, Johnny don't play fair." "Why not, my son?" asked the parent. "He won't let me lick him," answered the hopeful. The French simply do not purpose to allow their neighbors across the Channel to "lick" them if they can help it. At this meeting of the Chambers of Commerce, a Mr. Moore, of Plymouth, seems to have realized the absurdity of the resolution, and advised that it be withdrawn, giving his opinion that the French proceedings were not unfair at all. He said: "If "the French subsidized their shipping, it "was nothing more than this country had "done in years past. It was not long "since that there was a great outcry "against the defense of Cherbourg by the "French. What was the meaning of the "number of forts around Plymouth? Was "it not for the defense and protection of "the harbor? Then what right had they to "interfere or complain against the protection the French afforded to Cherbourg or "any other place in their own provinces? "They might take what measures they "chose to increase or improve or develop "the system of shipping, as the English "did." As might have been expected, this "spasm of sense" had no effect on the Associated Chambers, and they persevered in their attempt to run the commerce and government of the world so that it should all pay tribute to England.

England's Adverse Balance of Trade.

A correspondent sends us the following:

OCTOBER 12, 1881.

To the Editor of The Iron Age.—In your issue of September 29th, under "England's Adverse Balance of Trade," &c., you say: "It is a fact that "the amount of Great Britain's foreign trade has "been steadily and rapidly diminishing." Can you show this to be "a fact?" Your explanation that the English are becoming less manufacturers and more merchants or middlemen, is not satisfactory. England exported in 1880, £42,000,000 more than in 1870. Only in three years, viz.: 1872, 1873 and 1874, did she ever export more than last year. Late English Board of Trade returns show that her export trade is expanding rapidly in 1881, 10½ per cent. more in August than in the same month last year. The savings banks held £35,000,000 more in 1880 than in 1870. Would a change from manufacturers to merchants or middlemen have made that increase? I am, yours,

AN INQUIRER.

Though our friend who asks these questions does not give us his name, as the letter is written on the letter-head of a well-known firm and is of general interest, we shall endeavor to show our statement to be "a fact." It is fair to premise, however, that when we spoke of "Great Britain's foreign trade," we meant exports as compared with imports, and not the total of exports and imports. The letter of "Inquirer" shows that this is the meaning he attached to these words. The article treated of England's adverse balance, and it was in view of this adverse balance we stated that "Great "Britain's foreign trade has been steadily "and rapidly diminishing." Is this "a fact?" Whatever view we may take of Mr. Mongredien's principles and theories, we presume his facts and statements of facts are accurate. He is indorsed by the Cobden Club, and his statements are put forward under its authority and seal. Now, on page 82 of his work, "Free Trade and English Commerce," appears the following: "That we import "foreign goods to an amount largely in "excess of that of our exports, and that "this excess has of late years been far "greater than it ever was before, are notorious facts, which have attracted general "attention." Again, on pages 83 and 85 of this same work, referring to a table of imports and exports from 1861 to 1878, Mr. Mongredien says: "From this table we collect that, "with the exception of 1871, 1872 and "1873, we have regularly for many years "imported more than we exported, and "that the excess of imports during the entire series of eighteen years has, on balance, been £322,000,000, of which £231,000,000 represents the excess on the last "four years alone, viz., 1875, 1876, 1877 "and 1878." And to make this excess as small as it is, Mr. Mongredien has deducted 11 per cent. from the gross amount of imports, and added 11 per cent. to two-thirds of the imports, on the ground that the carrying trade, insurance, &c., which came to England, justly entitled these deductions and additions to be made. As a matter of interest, and to substantiate our statement that the amount of Great Britain's foreign trade has been steadily and rapidly declining, we add the table of gross imports and exports from 1861 to 1880:

TABLE OF IMPORTS AND EXPORTS OF GREAT BRITAIN SINCE 1861 (IN MILLIONS OF POUNDS STERLING).

Year.	Gr. imports.	Gr. exports.	Ex. of imprts.
1861	£217	£160	£57
1862	226	166	60
1863	249	197	52
1864	275	213	62
1865	271	219	52
1866	295	239	56
1867	275	226	59
1868	295	228	67
1869	295	237	58
1870	303	244	59
1871	331	285	46
1872	355	315	39
1873	373	311	62
1874	370	298	72
1875	374	262	112
1876	375	257	118
1877	394	252	142
1878	366	245	121
1879	...	...	...
1880	411	286	125

We have not been able to find a statement of exports and imports for 1879, but this table shows that the excess of imports over exports has more than doubled in twenty years, and in not one year of that time have exports equaled imports, though Mr. Mongredien, by his calculation of 11 per cent. for freights, &c., makes an exces of exports in three years, 1871, 1872 and 1873. It seems to us that this proves our statement that "the foreign trade of Great Britain is steadily and rapidly diminishing."

But there is another view of this question which the bare figures do not touch, and this involves the question as to whether the English are becoming less a manufacturing people. That is the question of exports relative to population. Mr. Edward Clarke, Q. C., M. P., addressed the Associated Chambers of Commerce of the United Kingdom, at its recent session, on the subject of the French Treaty. His remarks have only just come to hand, but they are precisely in place, and will save an extended calculation. In this speech Mr. Clarke said: "It has been said that "the exports of this country had largely "increased; the exports of this country "upon a long series of years had been, in "fact, diminishing. In the 'Statesman's "Year Book' for 1881, the exports of "British produce in 1870 amounted to "£6. 9/6 per head of our population. In "1879 they amounted to only £5. 12/2." After showing the relative imports and exports of several nations, Mr. Clarke continues: "If, therefore, it was true that "exports were to be the test of a country's "prosperity, and he confessed he thought "it was indisputably true, then the figures "he had brought forward showed that the "exports of England had decreased, while "those of all others had increased." This would mean that, relatively to other nations, Great Britain's foreign trade has steadily and rapidly diminished.

Let us recapitulate. As to our statement that Great Britain's foreign trade was rapidly and steadily diminishing, our facts show:

1. That the excess of British imports over exports has more than doubled in the twenty years ending 1880.

2. That the value of exports per capita of population was about 16 per cent. less in 1879 than in 1870.

3. That, relatively to the export trade of other nations, British export trade has largely fallen off. As examples, in ten years Germany had increased her export to England from £15,000,000 to £21,000,000; England's exports to Germany had decreased from £27,000,000 to £18,000,000. In the same period the exports of Austria-Hungary to England had increased by over 50 per cent., while England's exports to Austria-Hungary had decreased by one-half.

As to whether England has become less and less a manufacturing nation and more a merchant and middleman, it is a sufficient answer to this to say, first, that the exports of British products per capita have fallen 16 per cent. in ten years; and, second, that all the explanations given by English economic writers of the method of meeting the adverse balance, go to show that England is increasing as a merchant and middleman. It is shipping receipts, insurance, interest, commission, &c., that make up the £125,000,000 of adverse balance that Mr. Mongredien and Mr. Medley own is against them. England no longer, as formerly, pays for her imports with her exports and draws on the world for balances, but these balances go to pay for imports.

There is another view of the matter. If everything is satisfactory in England; if her trade is not diminishing; if she is not ceasing to be a manufacturing nation (or if she does not find it difficult to sell her manufactures, which is the same thing)—what is the meaning of this Fair Trade discussion? Why is it that influential bodies of manufacturers and workmen resolve in this wise: "That this meeting, regarding "with grave apprehension the present con"dition of British commerce and labor, "owing to the operation of foreign pro"tective tariffs," &c.? Or again, when they assert that there is great distress among the artisan class of Birmingham, and that manufacturers are taking their capital to countries in which they find protection for their industries, what does it mean? It all indicates to us that England is relatively ceasing to be a manufacturing nation.

We note a tendency all over the world to abandon many of the meanings that have attached themselves to the word "ton," and select some one of them as a standard. The charcoal iron workers, at their recent convention at Cincinnati, adopted the ton of 2000 pounds. This is the legal ton in Pennsylvania and many of our other States. It is virtually the metric ton in use so generally on the Continent of Europe, and the statistics of our American Iron and Steel Association, which have such wide currency, are in tons of 2000 pounds. It is a very simple ton to estimate and figure with, being virtually a decimal one. England, however, still adheres to its unmeaning hundredweight that is not a hundredweight, but 112 pounds, and to its ton of 20 hundredweight that is not 2000 pounds, but 2240 pounds.

One of the pleasant features of the Harrisburg meeting of the Institute of Mining Engineers, was the presence of Mr. E. Windsor Richards, of Bolckow, Vaughan & Co.'s, Middlesborough, and Mr. E. P. Martin, of Blenaevon, Monmouthshire. These gentlemen sailed for home on Tuesday last, followed by the regrets of friends that their visit could not have been prolonged. Messrs. Richards and Martin are delightful gentlemen, and we hope their visit to this country was both pleasant and profitable.

Production of the Precious Metals and of Quicksilver.

Since the so-called gold drain has begun to gradually bring about a depletion of the stock of that metal in Western Europe, and especially in France, carrying the bulk of it to our shores and the balance to British India, Italy, and, quite recently, to some extent to Austria, this diversion has not only attracted a great deal of attention, but it has finally influenced, in a direct manner, the discount rate in the chief money centres of Europe. The discount is raised in order to check, or at least moderate, the outflow of gold, and this enhancement of the current rate of interest, in its turn, affects the money market and disturbs the colossal bull speculation in stocks in London, Paris, Frankfort, Berlin and Vienna, while at the same time hampering the reckless speculation in merchandise which was tending to create a "boom" like the one two years since.

The "solidarity," as the French call it, existing between Europe and America in financial and commercial matters was at no previous time, we believe, more strikingly illustrated than during the past three years. Our export of food and other raw produce to Europe, &c., largely in excess of our imports, turned the so-called balance of trade so overwhelmingly in our favor that gold had to be resorted to in order to re-establish the equilibrium. European cereal crops being on the whole still deficient, shipments from here continue, and with them the gold drain.

Following in the footsteps of Mr. Horatio C. Burchard, Director of the United States Mint, Dr. Adolphus Soetbeer, the celebrated statistician of precious metals in Europe, has just published two pamphlets, one purely statistical, and the other showing the distribution of gold and silver. We extract therefrom the principal tables:

DR. SOETBEER'S ESTIMATE OF GOLD PRODUCTION, STOCKS AND DISTRIBUTION, IN TONS.

	1831 1840.	1841 1850.	1851 1860.	1861 1870.	1871 1880.	1831 1880.
Production	203	548	2,018	1,885	1,703	6,357
Monetary stock at close of period	850	1,200	2,833	3,841	4,690	.....
Increase of monetary stock	50	350	1,633	1,008	849	3,890

	1831 1840.	1841 1850.	1851 1860.	1861 1870.	1871 1880.	1831 1880.
Loss of weight in coins and coins lost	3	4	5	7	8	27
Excess of shipm'nts to the East	10	28	100	300	120	558
Industrial use	180	200	280	570	840	2,070
Decrease of latent reserve	40	34	.....	.....	114	.....

BALANCE SHEET OF GOLD MOVEMENT.

	Tons.	Tons.
1831—Stock	800	....
1831-1850. Production	....	751
Taken from latent reserve	....	74
1851-1880—Production	....	5,606
Taken from latent reserve	....	114
1831-1880—Increase of stock	3,890	....
Total	4,690	6,545
	Tons.	Tons.
1831—1850—Coin disappeared	7	
Shipped East	38	
Industrial use	380	
Monetary use	400	
		825
1851-1880—Coin disappeared	20	
Shipped East	520	
Industrial use	1,690	
Monetary use	3,490	
		5,720
Total	....	6,545

SILVER PRODUCTION.

	Tons.	Tons.	Tons.
1831—Stock	46,000	....	....
1831-1840—Production	....	5,965	
1841-1850— "	....	7,804	
1851-1860— "	....	8,955	
1861-1870— "	....	12,301	
1871-1880— "	....	22,245	
			57,270
1831-1840—Taken from latent reserve	....	1,406	
1841-1850— " " "	....	2,106	
1851-1860— " " "	....	1,054	
1861-1870— " " "	....	169	
			4,735
1851-1860—Taken from former monetary stock	....	4,500	
1861-1870— " " "	....	3,500	
			8,000
Increase of monetary stock..... 8,702			
Less decrease.. 8,000			
	700		
Monetary stock at close of 1880	46,700		70,005

SILVER DISTRIBUTION.

1831-1840—Disappeared through use and loss of coin	....	470
1841-1850— " " " "	....	510
1851-1860— " " " "	....	510
1861-1870— " " " "	....	470
1871-1880— " " " "	....	460
		2,420
1831-1840—Shipped eastward	....	2,200
1841-1850— " " "	....	2,400
1851-1860— " " "	....	11,300
1861-1870— " " "	....	12,300
1871-1880— " " "	....	10,800
		39,000
1831-1840—Industrial use	....	2,000
1841-1850— " " "	....	2,200
1851-1860— " " "	....	2,700
1861-1870— " " "	....	3,100
1871-1880— " " "	....	4,500
		14,500
1831-1840—Incr'se of monetary stock	....	2,700
1841-1870— " " "	....	4,800
1871-1880— " " "	....	1,200
		8,700
1871-1880—Transfer to latent reserve	....	5,385
Total	....	70,005

On referring to the gold tables, the gradual falling off in gold production will be noticed, and, on the other hand, the rapid increase for industrial use. Shipments eastward, it will be seen, decreased materially, but during the last few years British India has taken gold largely for ornaments, and that part of the world now attracts gold. The theory of the London *Economist* and other monetary authorities is that at present gold is getting scarcer.

The silver tables show that during the past ten years production almost doubled, while the East has taken considerably less, and that industrial use, although steadily on the increase, has not made much headway, while the increase of monetary stock has, during the past decade, been only 25 per cent. of what it was during the previous period of thirty years, when it averaged 1600 tons annually. Of special interest are the remarks of Dr. Soetbeer about the industrial use of silver in England, where, so far as silverware is concerned, it can be traced through the stamp tax thereon.

TAX ON STANDARD OUNCES.

1875	886,493	£66,487
1876	870,520	65,289
1877	823,392	61,755
1878	790,758	59,307

He says on this subject: "The decrease "of manufacture of silverware here shown, "despite the increase of population and "wealth in Great Britain, is attributed by "all authorities on silver to the extraordinary substitution of plated-ware for genuine silverware." If similar statistics could be procured in this country the superseding of silverware by plated-ware would, no doubt, appear still more striking, and this is an item of immense importance so far as the actual consumption of silver is concerned.

Intimately connected as the use of quicksilver is with the production of the precious metals, it may not be out of place to show the fluctuations in the output and price for a series of years:

QUICKSILVER PRODUCTION.—THOUSANDS OF FLASKS.

Year.	Spain & Italy.	Austria.	California.	Total.
1871	35	12	32	79
1872	38	13	30	81
1873	30	12	29	77
1874	33	13	34	80
1875	44	13	54	111
1876	42	13	74	129
1877	42	13	78	133
1878	45	12	63	120
1879	46	14	74	134
1880	48	13	50	111
1881, estimated	48	13	55	116

COURSE OF THE MARKET IN LONDON.

	Price per bottle or flask. Highest. £ s. d.	Lowest. £ s. d.
1850	15 0 0	@ 13 2 6
1860	7 0 0	@ 7 0 0
1870	10 0 0	@ 6 16 0
1871	12 0 0	@ 9 0 0
1872	13 0 0	@ 10 0 0
1873	20 0 0	@ 12 10 0
1874	26 0 0	@ 19 0 0
1875	24 0 0	@ 9 17 6
1876	12 0 0	@ 7 17 6
1877	9 10 0	@ 7 2 6
1878	7 5 0	@ 6 7 6
1879	8 15 0	@ 5 17 6
1880	7 15 0	@ 6 7 6

The present rate of consumption is estimated as follows:

	Flasks.
Continent of Europe	32 500
England	13 500
California	10 000
Mexico and West Coast	21 500
China	27 500
Atlantic States	11 000
Other Countries	2 500
Total	118 500

The average consumption between 1871 and 1875 was 85,000 flasks per annum, and between 1876 and 1880, 120,000 flasks.

As production this year may, from all appearances so far, not quite come up to the amount likely to be used, there has latterly been a rising tendency in the London and San Francisco markets. The market is controlled by the California mines on the one hand, and by Rothschild, who works the Almaden (Spain) mines, on the other. At a certain price Rothschild pays the Spanish Government, besides his rent, one-half of the surplus over and above such figure. Aside therefrom, there is the outside speculative element, which at times, with or without the aid of these controlling interests, runs up the price, and all these agents together watch gold and silver production very closely, as it exercises a powerful influence upon the consumption of quicksilver. Chinese consumption is, we presume, more for industrial than mining purposes. The Chinese are great producers of artificial vermilion and of cinnabar, and even export the same to a considerable extent. As our table shows, the fluctuations in value during past years have been extraordinary, ruled by all these combined influences.

Since the advocates of bimetallism have undertaken the ungrateful task of trying to get leading commercial nations to fix by law, for years to come, a legal proportion between gold and silver for purposes of coinage and international circulation, this question of the precious metals has been thoroughly ventilated. It seems to be utterly unmanageable, however, upon the basis proposed by the bimetallists, and the Paris congress or convention, as was predicted by all in favor of the sole gold standard, led to a signal failure, covering the promoters of the silver interest with unenviable ridicule. Whether they will, nevertheless, have the moral courage to renew the attempt and convoke a meeting in April next, remains to be seen. There are indications that they will. The only thing they may obtain are certain modifications in the way of coinage, &c., proposed by England and Germany, easing the situation that much, but by no means intended to rehabilitate silver to the extent its advocates demand.

Fortunately, public opinion in the United States is so decidedly on the side of the gold basis and of leaving well enough alone, that these schemes of squaring accounts with us in the cheaper and clumsier metal meet with no favor with our ruling classes, nor with the people at large, averse to everything that unsettles the standard of values.

The British fair-trade advocates seem in earnest in their advocacy of what they believe to be right. They have formed the National Fair Trade League, and such gentlemen as S. C. Lister, E. C. Healey, David MacIver, Sampson Lloyd and others have pledged £10,000 a year for five years for the maintenance of a propaganda. This means that England, not the United States, is to be the battle-ground of free trade.

The Mining Engineers at Harrisburg.

The Harrisburg meeting of the American Institute of Mining Engineers, a brief account of which is elsewhere given in this issue, was interesting and pleasant. In the matter of papers and discussions the session was not especially important; but it can scarcely be expected that engineers will give much time to the writing of papers during so warm and exhausting a summer season as that through which we have just passed. Besides, it is generally understood that the fall meeting will be devoted largely to excursions, and that more interest is likely to be felt in seeing than in listening.

The efforts of the local committee to contribute to the comfort and entertainment of the guests are deserving of especial recognition. They took a great deal of trouble, and must feel no little satisfaction in knowing that everything went smoothly and without accident or delay. The citizens of Harrisburg also placed the Institute under great obligations. The reception given by the citizens on the evening of Wednesday, the 26th, at the Executive Mansion of Governor Hoyt, was a very elegant affair, and more than sustained the reputation of Harrisburg for generous hospitality. The Cornwall Ore Banks Co. also extended to the Institute the courtesy of a bountiful entertainment at Lebanon; and the Pennsylvania Steel Works placed the membership under an embarrassment of obligation by first entertaining the visitors at lunch, and subsequently by an elegant dinner at Harrisburg, which took the place of what is usually the subscription dinner. In a word, everything pleasant and agreeable that could be thought of in advance was done to make the meeting delightful, and the resolutions of thanks passed before adjournment meant very much more than such resolutions usually mean. In this recapitulation of the hospitalities of the meeting, the favors extended by the railroad companies in the shape of special trains and free transportation wherever the Institute went, must not be forgotten. From first to last the visitors were the recipients of unusual courtesies and attention, and the meeting will long be remembered as one of the pleasantest in the history of the Institute.

Senator Voorhees on the Tariff.

The utterances of Senator Voorhees on the subject of the tariff, at the opening of the Atlanta Cotton Exposition, as our readers will remember, occasioned exclamations of surprise from all over the country. It was to have been expected that the free-traders in his party, which has at least its full share, would take him to task and demand explanations, and it appears that they have done so. In his reply, the Senator explains his position as follows:

"The platform of 1880 was a violent "departure on the subject of the tariff, and "has no precedent in the history of Democratic platforms adopted in National Conventions. I have examined them all. "The declaration for 'a tariff for revenue "only' was never before made in a National "Democratic Convention, and is a burlesque on common sense. Every tariff on "imported goods necessarily protects something manufactured in the United States. "To avoid all protection we must abolish "all tariff and resort to direct taxation. "The great question while we have a "tariff for revenue is to so adjust it as to "afford the protection which it always carries to those interests which need and "deserve protection, and to withdraw it "where it is not needed. This is my position at Atlanta, no more, no less. We are "compelled to have a tariff for revenue, "and protection is one of its absolute incidents, from which there is no escape, and "while this state of things exists I want the "West and South to embrace the advantages which arise from it. We lost Indiana "in the last three weeks in the campaign of "1880 on the absurd issue made by our "platform on this subject. In my opinion "that issue will never again be presented in "that form by a Democratic State or "National Convention, and my purpose at "Atlanta was to aid in securing a sound "position for the party hereafter."

We do not understand from Mr. Voorhees' statement that he is a protectionist, but quite the contrary. A tariff with him is not primarily for protection, but for revenue, and he is a protectionist only so far as it is a necessary concomitant of a tariff for revenue. A tariff that should aim to build up the industries of the South and West as its leading feature he would not advocate, if we understand his position, and as the primary object of a tariff in his view is revenue, he would so levy duties as to bring the greatest revenue. This may be good doctrine, but it is not protection, and Senator Voorhees can scarcely be reckoned among its apostles. It would seem that the objectionable part of the Democratic platform was the word "only."

Mr. Cyrus Elder appears to have been a "little previous" in his attack on Mr. John A. Norton, of Chicago, in reference to the Western organization known as the Industrial League of America. While it may be unfortunate that the names of the Eastern and Western organizations are so much alike, it appears that so far from Mr. Norton being responsible for the similarity, as charged by Mr. Elder, it was adopted in spite of his protest. Mr. Elder was also a little unwise in characterizing Mr. Norton as "designing and helpless." Mr. Henry Carey Baird comes to the defense of Mr. Norton as follows: "Mr. Norton I have known intimately and well for nearly 25 years, and my late kinsman, Henry C. Carey, knew him for an equal length of time. The esteem in which I hold Mr. Norton is not surpassed by that which I feel for any other man, and I believe that Mr. Carey to the last hour of his life held him in the same regard that I do myself. I think I know him well enough to say that he is neither 'designing' nor 'helpless,' but I do know that for now nearly 20 years, during which time he has been indoctrinated with Carey's philosophy, no man on this continent has made greater sacrifices in the cause of American industry than he. Indeed, he has almost sacrificed all his prospects and well-nigh life itself; and until that life goes out he will be the same true and devoted champion of this cause. If he be 'helpless' at all, it is in his struggle to release himself from the influence of this spell which holds him in an iron grasp. The man who at an early age, in the midst of poverty, cheerfully took upon his shoulders the burden of his father's family and gave them good educations and brought them up in respectability, and always afterward looked tenderly after them, cannot be a bad man. This one is not!" This is certainly an indorsement that it will be difficult to gainsay. It is unfortunate that this controversy should have been precipitated. Both of these organizations can find plenty of hard work to do in the same line without wasting their strength fighting each other, and both Mr. Elder and Mr. Norton are too sensible and too honest to allow what seems to have been an assumption on Mr. Elder's part to stand in the way of their future work.

The Progress of a Year in Stove Founding.

Now that the season's harvest of catalogues and circulars has been pretty much gathered, we can form from an examination of those piled upon our table a tolerably good idea of what the progress of the past year has been in the stove business. It is something of a confession to say that we scarcely know whether to feel gratified or disappointed. In some respects the progress of the year has been satisfactory; in some respects it has been uneven; in others there seems to have been no progress at all. Whether the net result is satisfactory or not depends very much upon what one expected. Probably our manufacturers have done what they considered best in all respects under the circumstances. Conservatism may not always be an agreeable basis of business policy, especially to those impatient for forward strides, but it is usually safe and profitable. The average manufacturer is not a man of original ideas, and perhaps it is just as well for him that he is not. Ideas are dangerous things. They often lead men away from safe business methods and prompt them to squander their capital in missionary work which brings them neither honor nor profit. To realize from ideas and make them contribute to swell a bank account requires genius. The man without genius is no doubt safer in the beaten paths of the commonplace than he is in essaying the untried and often dangerous passes of bold business enterprise. Good average business ability is a long way from genius, and as business ability pays, genius cannot as yet be said to have had "its innings."

If we were in a position to contemplate the progress of the past year from the standpoint of the stockholder or partner whose capital was at stake, we should doubtless find it quite satisfactory. It has been a good year. Large production has been needed to meet the demands of the market, and the prices realized have afforded a profit. The trade have bought, and consumers are taking the goods made, without protest and probably with approval. No one can say that manufacturers have not been enterprising in a certain way. They have expended vast sums of money in their pattern shops, and many stoves have been changed and "improved" for no other reason than a desire to bring them up to the picket line of the fashion in everything which pertains to stove millinery. The catalogues are crowded with new goods, and everything which promised to return two dollars for every one expended, has been done to encourage business and satisfy the dealer. All this is very well. It shows that the stove manufacturers are awake, and that they are planting wherever there is a prospect that a harvest can be gathered.

Under circumstances so satisfactory from a business standpoint, we ought, perhaps, to experience only feelings of gratification at the results of the year. But, as we intimated at the outset, we probably expected too much. When we think of the possibilities of iron as a material, and the inducements offered for an art progress in all departments of foundry work, we are impatient at the delays which seem so tedious. In the matter of stove ornamentation there has undoubtedly been some progress—we may even say a good deal. There have been stoves made in the several classes of heaters and cooks which may even be considered beautiful. But in the typical stoves of the year—those which in their respective classes fairly represent the great bulk of the year's production—the "meretricious" still predominates, and both beauty and utility are sacrificed for the sake of glitter and show. And, just here, let us say we have heard all about the people demanding it, and the dealer insisting upon it. It may all be so—but we don't believe a word of it. With the masses of the people it is Hobson's choice. That they refuse to buy these stoves without the ornaments which may properly and with deliberation be called meretricious, proves simply this—that when these stoves are denuded of their ornaments there is nothing left to commend them even to the vulgar taste. The manufacturer who should announce that his base burner would be sold with or without nickel trimmings, could do so with entire confidence that not half a dozen would be ordered without. We shall have a chance to determine the value of meretricious ornamentation in general when the public shall have a chance to choose between stoves which are so good in the iron that they do not need to be covered over with appended ornament, and stoves which must be so covered to make them saleable at all. Our only just cause for impatience with what seems to us an unintelligent adherence to prevailing styles, is that we believe it would be a better business policy, and one attended with larger profit, to make stoves which are beautiful without millinery. But we no longer expect manufacturers to rush into this sort of thing on the dicta of the art critics. Their capital is involved; their trade is at stake. They will cling to what is known and popular until the demand for something quite different is created by some one else. If the many are only prepared to follow as fast as the few may lead, it is all that can be expected of them, and perhaps more.

In practical matters of construction, the progress of the year has been about all that could reasonably be expected. The satisfactory burning of soft coal in cooks and heaters has been in some instances measurably, and in others absolutely, attained. This is important, as bituminous coal is the fuel on which by far the greater part of our population must depend, and whatever tends to abate or abolish the nuisance of choked flues and smoking chimneys tends to comfort and economy. In stoves for anthracite and wood there has been less room for improvement, but in goods of this class we have evidence of a closer and more intelligent attention to details. In cook stoves especially, there is a constant effort for improvement. So far as possible the needs of the housekeeper have been considered and provided for, and when the average cook stove is well managed good results are to be expected. It is true that the amount of fuel required to do a given amount of work is still much greater than it should be in relation to its theoretical value; but high fuel economy is not especially desired by stove users, and the problem of saving coal in domestic consumption has a prospective rather than a present importance. The general introduction of mechanical grates has a tendency to prevent the waste of fuel usually attending the cleaning of fires with the poker, and to reduce the difficulties of good management. When a single mechanical motion relieves the fire of its ashes and brings live coals to the grate, nothing more can be asked for. We are a little surprised that Mr. Filley's very interesting and instructive experiments with wire gauze oven doors have not had a more pronounced influence on the fitting of cast oven doors than they seem to have had. But perhaps we can look for this in the future. An idea so revolutionary is not likely to meet with ready acceptance, even when demonstrated. But whatever it lacks of scientific completeness, the modern cook stove is a very convenient apparatus, and within a year its appearance has considerably changed for the better. Grotesque ornamentation we seldom see nowadays.

In heating stoves there has been considerable improvement, notably in the matter of urns and top ornaments generally. There are still a good many in use which are dreadful to contemplate, but the average has been greatly raised by the introduction of spun-brass urns. We hope it will not be long until clumsy and rough constructions in cast iron are abandoned altogether as urns, and smaller, neater and more symmetrical substitutes found for them. Nickel does not seem to be quite holding its own. We know it is still a dependence, but we detect evidences of a desire on the part of manufacturers to use it more sparingly, and not to put it where it is certain to be discolored by heat. That it will ever be abandoned is improbable, and we see no reason why it should be. All we can ask is that its use be kept within reasonable limits, and the tendency seems to be that way.

In this very general review of the situation we seem to have pointed out a good many grounds for satisfaction at the year's progress. Well, they are numerous and strong. A good many hopes have been deferred, and some expectations disappointed, but they were of the kind which can wait for realization. It is certain that the stove trade is not hampered to any considerable extent by a desire to oppose progress. Change is the order of the day, and out of change will grow progress—sooner, perhaps, than the trade expect. In matters of form and ornamentation, a little of the leaven of art will sooner or later leaven the whole lump, and as this leaven is at work, accomplishing its purpose in strict accordance with good business principles, we can leave the result to the operation of forces which, if silent and slow, are irresistible. Considering everything, we congratulate the stove trade on the progress of the year.

Some Coal Statistics.

The report of the Director of Mines of Liége, Belgium, which is just at hand, is of much more than usual interest. The details of production are not only very full and complete, but the report includes many minor statistics that do not usually enter into such documents, and which give an insight into the workings of these mines that is valuable. We extract from the report the following table giving some details of the operations for 1879 and 1880:

	1879.	1880.
Workmen employed by day, Number	16,907	17,825
Workmen employed by piece, Number	5,249	5,611
Total number	22,156	23,436
Wages paid, francs	19,214,525	22,118,590
Average annual wages per man, francs	867	943
Total output, tons	3,581,325	3,823,629
Average per pit	42,635	46,061
Average per man, tons	162	163
Total value, francs	32,809,280	38,352,120
Expenses of production, fr.	36,187,350	36,944,560
Selling price per ton, francs.	9.16	10.03
Cost price per ton, francs	9.26	9.66
Number of mines making profit	25	37
Amount of profits, francs	2,030,000	2,907,750
Number of mines making losses	35	37
Amount of losses	2,408,070	1,500,190
Net result, francs	— 378,072	+ 1,407,560
Net result per ton, francs	— 0.10	+ 0.37

It will be interesting to compare these figures with those of this country. There is not, however, any mining district here where the conditions of coal mining are the same as in Belgium. By making a comparison with the anthracite and bituminous regions of Pennsylvania, however, we can arrive at a comparison that may show the differences in the condition of the coal industry in the two countries. The figures of the anthracite industry are from the Census Bulletin; those of the bituminous are from the reports of the Inspector of Mines of the First District of Western Pennsylvania:

	Belgium.	Anthracite, Pennsylvania.	Bituminous, Pennsylvania.
No. of workmen	23,456	68,239	21,364
Wages paid	$4,423,728	$21,680,120	.....
Aver. annual earnings per man	$188.60	$353.08	$382.82
Total output, tons	3,823,629	27,433,329	12,155,248
Aver. annual output per man, tons	163	434.4	662
Total value	$7,670,424	$40,311,951	.....

These figures show either that labor is very much less effective in Belgium, that the conditions of mining are much more difficult than here, or that the works run very irregularly. Whatever may be the cause, however, labor is much less effective in Belgium than in America. It certainly seems as though there must be some mistake in the Belgic figures. If there is not, the table is only a renewed evidence that the lowest paid labor is not always the most effective.

It is interesting to compare these figures of the actual output per man per year with those of other countries and districts.

OUTPUT OF COAL PER MAN PER YEAR.	TONS.
1880—Anthracite, Pennsylvania	454
Bituminous, First District Pennsylvania	499
1879—North Staffordshire, England	237
Northumberland and North Durham, England	208
South Wales	281
West Scotland	312
South Durham	356
South Staffordshire	373
Belgium	163
1878—Belgium	162

The back of the great Cincinnati strike is broken. The rolling mills on the east side of the city will all be in operation before the end of the week, an adjustment of the differences between masters and men having been reached which we shall be better able to discuss next week. The following is the basis of agreement: "We, the "proprietors of the rolling mills in Cincinnati and vicinity, agree to pay the prices "ruling immediately prior to June 1st last, "provided the skilled workmen will agree "to continue these prices in force and to "continue operations until the next card "rate shall be established in Pittsburgh, "and after the adoption of said card the "same shall be the price in all our mills. "The proprietors do further agree, in consideration of the acceptance of said Pittsburgh rate, to employ all labor about the "mills and furnaces that is employed in "Pittsburgh." Thus ends a disastrous and altogether unreasonable strike of five months, by which 2000 mechanics have been kept in idleness at the loss of five months' earnings, besides the large amounts drawn from the treasuries of the Union. It will take a much longer time than any one can look ahead to make up what the men have lost by their long idleness; but simple calculations in arithmetic like this seem to have no interest for the mechanics who obey the Union. The net result of this great strike is that everybody is badly hurt, and none so largely benefited as to in any respect compensate them.

Railway Progress in Florida.—The Pensacola *Gazette* says: There is no doubt that an era of prosperity is dawning upon Florida, and that in a few years it will be as easy to go from here to other parts of the State as it is now difficult. Our Pensacola and Atlantic Railroad, which, when completed, will connect us with Jacksonville, Tallahassee, &c., will also, by the completion of the new roads above referred to, place us in direct communication with the Peninsula of Florida at least as far as Tampa. Northern capital is largely aiding the new enterprises in South Florida.

AMERICAN INSTITUTE OF MINING ENGINEERS.

(Continued from our issue of October 27.)

HARRISBURG, TUESDAY, October 25.

Mr. Richards, in regard to the development of the basic process, briefly referred to in our last issue, said that about three years ago Messrs. Thomas and Gilchrist prepared a paper which was read at Paris. This paper related to their method of steel production, and set forth its advantages in a striking light, notwithstanding which but little importance was attached to it. Mr Richards, after witnessing several trials made according to their method, was very favorably impressed with it, and proceeded at once to conduct a number of experiments himself. Great difficulty was experienced in the manufacture of the bricks for the lining of the converter. Unequal shrinkage and consequent distortion was a great obstacle, the main difficulty, however, consisting in the proper regulation of the temperature. With a low temperature it was found that the bricks easily broke up, while, when a high temperature was used, the bricks were fused, and, in sticking together, formed one compact mass. Mr. Richards therefore abandoned the idea of lining his converter with basic brick, and proceeded in the following way: Into the converter he placed a hollow frustum of a cone of cast iron, of such an external diameter as to leave between it and the sides of the converter an annular space of sufficient thickness for a lining. (See Fig. 1.) Dolomite, well burnt to drive

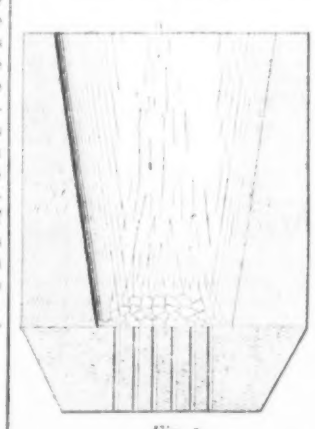


Fig. 1.



Fig. 2.

off any gases, ground and mixed with coal tar, was then shoveled into this space, the operation being performed in about 12 hours. After some time the cast-iron plug was removed and the lining subjected to a high temperature, after which it was ready for use. The top and bottom of the converter can be separately lined, being detachable. The bottom is made around a number of pins of small diameter, between which the composition of dolomite and tar is tightly packed. The withdrawal of these pins makes passages in the blast. A bottom prepared in this way will last for about 12 blows. After several experiments with the ordinary shape of converter, it was found that slag was deposited at its mouth, ultimately closing it up completely, and on this account a converter top of such shape was adopted that all solid particles carried to the top should again fall back. With this improvement no further difficulty was experienced in this direction.

The accompanying figures will serve to render the process of dephosphorization of iron more comprehensible. Mr. Richards stated that if we considered Fig. 2 as a bar of iron with its impurities all gathered at the top as indicated, then should the top be removed we would have a bar of pure iron remaining. In the blowing operation let us consider the converter turned on its side; a few shovels of coal are introduced, together with some lime, whereupon a red heat is produced. The iron is then run in and the blast turned on for about 12 or 15 minutes. Judging by Fig. 3, we observe

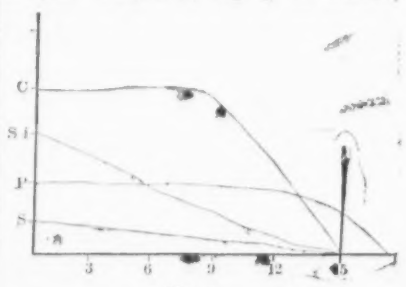


Fig. 3.

that silicon and sulphur are gradually eliminated; the carbon remains unchanged in quantity for some time, and then suddenly begins to diminish until it is wholly eliminated at the end of 15 minutes. (It should here be stated that each of the divisions on the horizontal line indicates 3 minutes). Phosphorus is observed to be still present to some extent at that time, necessitating what is termed the "after-blow" to effect its removal. After about 18 to 20 minutes a sample of the contents of the converter is taken, is cooled and placed under the hammer. The fractures will indicate approximately the quality of the sample, large shining crystals indicating the presence of considerable quantities of phosphorus. Silicon should be present only in small quantities in iron which is to be subjected to the basic process, on account of its fluxing properties when in connection with the lining of the converter. In regard to the addition of "spiegeleisen," Mr. Richards remarked that there was no difficulty in mixing it with the contents of the ladle. By the addition of "spiegeleisen" in the old process, rephosphorization often, if not always, occurred. This difficulty is, however, easily overcome by first adding silicon. The hematite when poured into the ladle forces out the slag, which then flows over the sides and is warded off by an intervening screen.

After some discussion relating to several

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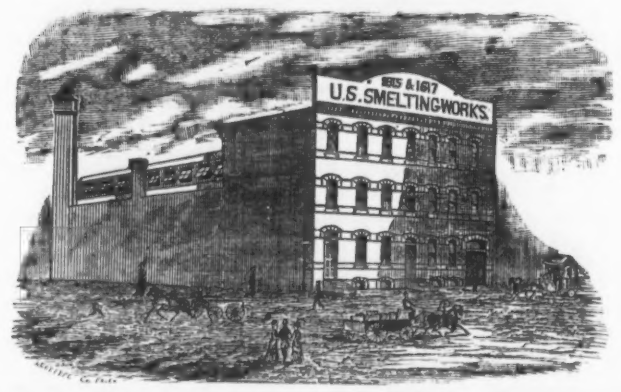
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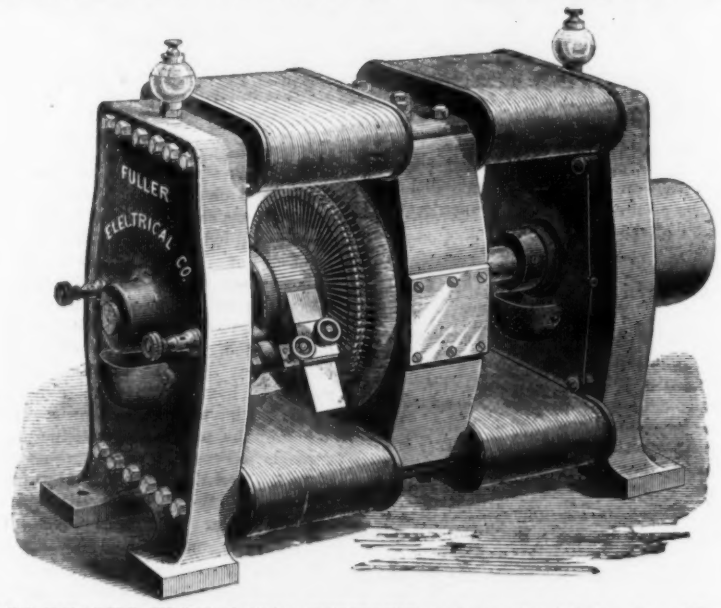
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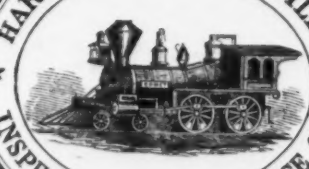
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points, President Metcalf thanked Mr. Richards for his very interesting and clear statement of the process. The session was then closed, all present congratulating themselves on having reaped much benefit from the evening's proceedings.

Wednesday's Meeting and Excursions.

At 9 a. m. on the morning of the 26th the second session of the Institute was opened, and Dr. H. Marbyn Chance, of Philadelphia, was first called upon to read a paper on the "Available Tonnage of the Bituminous Coal Fields of Pennsylvania." He had, as an illustration, a copy of a map of the Rogers Geological Survey and a diagram showing the deposits of bituminous coal in the several counties. Mr. Chance, in his calculations, ignored all coal seams less than 2 feet in thickness, and estimated the entire area of the coal districts of Pennsylvania to be from 12,000 to 13,000 square miles. The tonnage he assumed to be 1500 tons per acre per foot of thickness. After describing in detail the extent and character of the coal deposits, the cost of mining them, which of them are available for market and which only valuable as sources of local supply, the conclusion reached was that the bituminous coal deposits were of such extent as to meet the probable demands upon them for at least five centuries.

Mr. Charles A. Ashburner described and explained the principles of a new furnace for the prevention of smoke and economy of fuel. A thorough comprehension of the paper requires the presence of several drawings, and the interesting information conveyed by the article will justify its appearance in our columns at a later date.

Mr. A. C. Rand, of New York, then read an unfinished paper on a new blasting powder called "Rackarock," the ingredients of which are a solid and a liquid, non-explosive when separate. He referred to the refusal of some of the railroad companies to transport explosives under any circumstances, and stated that necessity compelled the invention of some means by which the component parts could be transported without danger and could be easily and quickly mixed when required for use. As before stated, the two ingredients are a fluid and a solid, the union being effected by a safe and ingenious method immediately before use. By diminishing the proportion of the fluid less smoke is produced, and it has been found that an increase of the fluid above a certain fixed proportion will not add to the power, but will increase the quantity of smoke. The cartridge is exploded with a strong cap or exploder, which is inserted through a narrow slit in one end of the cartridge, the powder being packed firmly around it, in order to prevent its displacement when the charge is lowered into the blast hole. Sand or clay may be used for tamping. The powder has the advantage over others in being applicable in wet holes or under water, and the fluid is said not to freeze even where the weather is excessively cold. Mr. Rand having read a description of the essential features of the new explosive, the session adjourned.

At 11.30 a.m. the members of the Institute, accompanied by a large number of ladies, embarked on a special train provided by courtesy of the Pennsylvania railroad, and visited the Pennsylvania Steel Works, The Lochiel Rolling Mill, Paxton Furnaces, Paxton Rolling Mill, Central Iron Works, Chesapeake Nail Works and the Harrisburg Car Mfg. Co.'s Works. A lunch was furnished at Steelton by the Pennsylvania Steel Company. Among the many things of interest witnessed at the Paxton Furnaces, the experiments with the new powder described by Mr. Rand most certainly occupied a prominent position. Ten holes were bored and charged with the explosive, while the spectators were eagerly awaiting the result. At a given signal the charges were fired, and more than 1200 tons of rock were shattered, fully realizing the expectations of all present. Harrisburg was reached at about 6 p. m., and preparations for the evening programme were commenced. At the Governor's mansion, at 8.30 p.m., a reception was given by the citizens of Harrisburg to the members of the Institute and ladies. In the absence of the Governor, who had gone to Atlanta, Colonel Henry McCormick, with Mrs. Governor Hoyt, received the guests. Nothing was neglected that could add to the enjoyment of the evening. The floral decorations were beautiful. Rare exotics and choice cut flowers were to be seen on every hand. The table, which was set in a room to the rear of the parlors, was one of the most elaborate pieces of work of that character ever seen in the city. Several of the decorative pieces were gems of art. One, an eagle carved out of a huge piece of ice, and another, a pair of doves made of the same material, were especially admired for their novelty and beauty. The good things to feast upon were not neglected by the citizens and strangers present. The table was set and supplied by a caterer from Philadelphia, who displayed exquisite taste and skill in the arrangement. Promenading and dancing were the features of the evening's entertainment. At a late hour the delightful affair broke up, when the guests returned to their respective hotels to rest themselves for the excursion of the following day.

Thursday.

At 9 o'clock a. m. (October 27), the members of the Institute and their invited guests assembled at the Cumberland Valley Railroad depot, preparatory to the anticipated excursion to the hematite ore mines of the Philadelphia and Reading Coal and Iron Company; the hematite ore mines on the line of the South Mountain Railroad; the Carlisle Iron Works, Laurel Forge and Pine Grove Furnace. The "Beltzhoover Bank," one of the Cumberland ore banks, was first visited. This bank is of an average depth of 40 feet, and its annual capacity is about 25,000 tons of hematite iron ore. The "Ege" ore banks next received the attention of the party, which was here treated to an entertainment in the way of a blast. After the lighting of the fuse a suspense of some time elapsed, and opinions to the effect that the light had gone out were repeatedly expressed, which opinion was, however, most strikingly shown to be erroneous by the sudden upheaval and disappearance of an opposite bluff. The blast was in every way successful, and the spectators expressed themselves highly pleased by the exhibition. The next stop was made at the famous Carlisle Iron Works, situated at Boiling Springs, owned and managed by Colonel D. Ahl and his son. The boiling springs occupied the attention of the excursionists to a great extent, and all were absorbed in the sight of the clear limpid water bubbling from the bottom of the large basin in many places.

Having satisfied their curiosity, the guests re-embarked in the train, the next point of attack being Laurel Forge on the South Mountain road. When the locality was reached a general survey of the establishment was made and many new points of interest inspected. The well-known picnic grounds, Pine Grove Park, was the next station. Here all disembarked and strolled through the woods. Though the place had a deserted look, yet there were many attractions that engrossed the attention of the excursionists. The "flying horses" were mounted by various members of the party, and while some good-natured individual turned the crank, many ladies and gentlemen indulged in a ride around the circle. Old Pine Grove Ore Banks came next in the order of events, and with the deep ravines and ore washer served to make the short stay at that point one of great interest. Laurel Furnace, two miles and a half from the forge, was reached shortly afterward. This furnace was undergoing repairs; new boshes were being put in, the blowing was being overhauled and other improvements were receiving attention, for the purpose of increasing the capacity of the furnace. At this station a bountiful lunch was served to the excursionists by Mr. J. C. Fuller, president of the Pine Grove Furnace Company. Mr. Fuller being ill, Daniel King, superintendent, Horace Keefer, assistant, and W. H. Woodward, treasurer, did the honors of the occasion. The lunch was greatly enjoyed.

Bidding good by to the gentlemen whose kind attention to all was so well received and appreciated, the party's next visit was to the Carlisle Indian school. Much attention was here bestowed upon the young copper-colored boys and girls of the West, and surprise was in many instances shown at their remarkable progress from a state of barbarity to that of civilization. Capt. Pratt was the same kind-hearted and courteous gentleman he always is, and did everything in his power to entertain the visitors pleasantly. The school is provided with a gymnasium and workshop, thus affording the young savages ample opportunity to develop and put to good use their muscular power. They are, moreover, not without musical taste, as was well shown by the performance of a brass band of young Indian boys, who played very well. The party arrived at the Cumberland Valley Depot, Harrisburg, at 6 p. m., all delighted with the day's trip. Much of the pleasure of the day's excursion was due to the admirable management of the general agent, Mr. James Clark, of the Cumberland Valley Railroad Company.

In the evening, at 8 p. m., there was a session of the Institute for the reading and discussion of papers. The essay on the "Analysis of Iron Ores containing both Titanic and Phosphoric Acids," by Messrs. T. M. Drown and P. W. Shimer, Easton, Pa., was first read, imparting much interesting and important information. Dr. Drown then read two papers, one of which related to the "Analysis of Steel," by Messrs. Gayley and Farrell, and the other to a "Short Method of Determining Phosphorus in Steel by the Use of Ammonium Molybdate," by Mr. Benj. D. Wright. After a short discussion regarding some statements in these essays, Major Hotchkiss gave an account of "The Great Coal Fields of New River in Virginia and West Virginia." He pointed out the great importance of these coal beds as a source of general supply, and their ease of access as soon as the new railroads, now in course of construction, were completed.

Friday.

On Friday, October 28, there was another session at 9 a. m., which was rendered attractive and interesting by the reading of several papers, the first being by Mr. F. C. Blake on "Test Supports for the English Cupellation Furnace." Mr. Kennedy described an "Improvement in Fire-brick Stoves," dwelling, to a considerable extent, upon the shape and size of the flues for the passage of the heated gases. Ordinarily, flues of a square section 4 inches each way are used, and in a short time dust and dirt are swept into them by the heated gas currents depositing themselves in the corners, and thus forming in reality flues of an octagonal section. In these flues from 40 to 50 per cent. of the convective power is lost. Mr. Kennedy recommended the adoption of circular flues and pointed out the great importance of smooth joints. The gases rushing through the passages with a velocity of 300 feet per minute, would produce considerable friction with but a very slight inequality of section.

Mr. McCreath, who was then called upon, said that he had not specially prepared a paper, but merely wished to make a brief statement regarding the determination of phosphorus in iron. Having communicated the information mentioned, to be subsequently written for the "Transactions," the president called upon Gen. Hall, who gave some interesting particulars about harbor fortifications. The principle of the system described is not entirely new, being similar to that of the monitors, so well known as taking a prominent part in our civil war. The fortifications consist of steel turrets heavily armed with guns, and of a massive lower structure, upon which the turret is so fixed as to be capable of turning on its axis. A further addition calculated to increase the effectiveness of the battery and to afford more complete protection from the enemy's fire, consists of a circular mass of earthwork. The lower structure of the battery is so arranged that it can be made to revolve around this earthwork, the turret at the same time revolving about its own axis. When the battery is in such a position as to be protected from any direct fire, there is no appreciable danger whatever, since shells from a mortar cannot be thrown with sufficient accuracy to do much damage. Gen. Hall explained the method of connecting separate forts by means of submarine cables, and dwelt upon their effectiveness in arresting the progress of vessels. He stated that with this system of defense, together with torpedoes and other submarine attacking agents, the entrance to any harbor might be effectually barred against any attacking fleet.

Having concluded this paper, it was announced by the president that probably an extra session in the evening would take place for the reading and discussion of Mr. T. F. Witherbee's paper on "The Use of High Explosives in the Blast Furnace." Adjournment was then proposed, and the members, with ladies and invited guests, assembled at the depot of the Philadelphia and Reading Railroad to visit the Colebrook Furnaces and the Cornwall ore banks. The Colebrook Furnaces, which were first inspected, were not in blast. Much surprise was manifested at their costly arrangements and beautiful finish. Everything is expected to be in readiness in a few months to blow in. After having spent considerable time at this place, the party re-embarked and were carried to Lebanon, at which place a bountiful lunch was served by the courtesy of the Cornwall Ore Bank Company.

The next thing in order after the lunch was the visit to the Cornwall ore banks, which were reached after a pleasant and interesting ride. The picturesque scenery at this place amply repaid the exertion of clambering up a steep hill to obtain a good view, and all expressed themselves greatly delighted. Harrisburg was reached at about 6 p.m. The extra session previously referred to took place at 7 p.m., Mr. Alexander presiding, in the absence of President Metcalf. Mr. Witherbee's paper was then read, and proved of such interest that we will give it in full at a later date. The meeting terminated at 8 p.m.

At 10 p.m. a complimentary dinner was given to the members of the Institute, at the Lochiel Hotel, Harrisburg, by the Pennsylvania Steel Company. A merry party assembled, and it may be taken as granted that they did justice to the dinner and the wines. A number of speeches were delivered during the evening, all characterized by wit and good taste. At an early hour in the morning the guests retired, with many expressions of regret that the pleasant time had so quickly passed and that the hour for parting had come. The extra session of the Institute, at 7 p.m. on Friday, was the last in connection with the Harrisburg meeting, and on Saturday, October 29th, the members went off in different directions to their respective homes.

In addition to the papers which were read and discussed at the meetings, the following were presented by title:

1. "Chemical Methods for Analyzing Rail Steel," by Magnus Troilius, London, England.
2. "Method of Assaying Silver Bullion," by F. C. Blake, Mansfield Valley, Pa.
3. "An Apparatus for the Rapid Determination of Carbon in Pig Iron," by A. B. Clemence and Ed. Hart, Easton, Pa.
4. "Notes on the Geology and Mineralogy of San Juan County, Colorado," by Theo. B. Comstock, Eureka, Col.
5. "The Analysis of Statistics," second paper, by A. W. Hale, New York City.
6. "The Native-Silver Belt of Batopilas, Mexico," by I. C. F. Randolph, New York City.
7. "A New Form of Wet Silver Mill," by I. C. F. Randolph.

Compressed Air on the Elevated Railroads.—A successful experiment with an engine propelled by compressed air was made on the 25th ult. on the Second Avenue Elevated Railroad, in this city. The engine was built at the Baldwin Locomotive Works, Philadelphia, under the supervision of Mr. Robert Hardie, a Scotch engineer. There are four tubular boilers or tanks in which the compressed air is stored. The machinery resembles that of an ordinary steam engine. The locomotive on trial has many devices for economizing the air. The reservoirs are connected by pipes, so as to virtually form one large reservoir. The tanks were charged shortly before the trip, and the locomotive started from One Hundred and Twenty-seventh street, having behind it four cars with passengers. Mr. Hardie ran the train to Forty-second street and back to One Hundred and Twenty-seventh street, stopping at all the stations. The train went at the rate of 12 miles an hour. It is believed that the engine can be run to South Ferry with a single charge of air. According to the present plans, if the system were adopted, there would be tanks from which the engines can be charged at both ends of the route. It is claimed that compressed air will be 50 per cent. cheaper than steam. Further experiments with the engine will be made. Mr. Hardie is the inventor of the system.

Dingler's Polytechnisches Journal (Augsburg) recently contained a paper describing several new systems for the prevention of accidents in collieries from the breakage of the winding rope. That of Heinrich Solfriane, of Burendorf, near Bochum, is illustrated. By an arrangement of spiral springs, the moment the strain is taken off the draw-bar four forked levers are forced against the guides, which are of wire rope. These levers, by forcing the rope outward, prevent the possibility of the cage moving, as the rings which run on the guides cannot pass over the portion which is forced out. Several other systems are also described, but the one here mentioned is principally dwelt upon.

Spanish papers are at present strongly arguing in favor of the introduction of iron and steel sleepers for railways. The wooden sleepers employed there now are obtained from foreign countries, while those of iron and steel could be manufactured in Spain. The *Gaceta Industreal* estimates the probable demand for the first 10 years to be 500,000 tons, the manufacture of which would yield an income of 20,000,000 francs.

The Barbed Wire Fence Controversy.

REPLY FROM JUDGE COLE.

We have received the following letter from Mr. C. C. Cole, of Des Moines, Iowa, in which he replies at length to the communication of the Washburn & Moen Mfg. Co., printed in our issue of Oct. 13. We may say that the statement from Messrs. Clarkson & Gue is inclosed separately to us and is signed by both of these gentlemen:

DES MOINES, IOWA, Oct. 24, 1881.

To the Editor of The Iron Age.—SIR: There is no desire or purpose on the part of the Farmers' Protective Association, which I represent, and certainly not on my part, to prejudice the community against Washburn & Moen Mfg. Co. or their patents. It must be conceded that Mr. Washburn (who manifestly, by the statements in the communication, prepared it) is very sagacious and artful in presenting his side of the case; and to one acquainted with all the facts, his shrewdness is doubly more manifest in his suppression of the truth than even in his distorted statements of claimed facts.

Mr. Washburn claims that the patents in which his firm are interested have "been declared to be good and valid." Yet it is fully true that no final decree or judgment has ever been rendered by any court in any contested suit sustaining the validity of any one of their patents. The only final decrees or judgments ever rendered in their favor, in any suits involving the validity of any of their barbed wire patents, have been entered pursuant to a compromise between the parties, and not by virtue of the considerate judgment of the courts upon the merits of the case. It is true that in one case in Connecticut the form of the decree was that of one rendered in cases of contest and upon the judgment of the Court. But afterward, and when Judge Shipman's attention was called to it by one not a party to the litigation, he caused the fact to be made of record that the decree was rendered upon the compromise and agreement of the parties, and not by virtue of the judgment of the Court.

In the fourteen Chicago cases, final decrees upon consent and agreement of parties were entered in all except the two cases against Jacob Haish, and in each of these two cases an interlocutory decree was entered; in the one, sustaining the Glidden, and in the other, the Kelly patent. A final decree is conclusive upon the parties and cannot be set aside or in any way changed, even by the Court, after the adjournment of the term at which it is rendered; while an interlocutory decree is not conclusive upon any one, and may be wholly set aside or disregarded by the Court at any time thereafter. And in the two Haish cases there have since been final decrees entered by consent, whereby the interlocutory decrees have been disregarded and annulled, and each party pays its own costs; and Haish withdraws and keeps as his own all the money paid into court by him as royalty under the interlocutory decrees. What, in view of these facts, becomes of Mr. Washburn's boast that the barbed wire patents in which his firm are interested have been adjudged good and valid by the highest courts known next to the Supreme Court?

But this much-vaunted claim of judicial determination, so put forth by Mr. Washburn as a vindication of, and a tower of strength for, his firm and their claims, when viewed in the light of all the facts surrounding the rendition of the consent decrees and judgments, becomes a just reproach and a manifest element of conscious weakness of his firm's asserted claims.

Mr. Washburn says in his communication, to which this is intended as an answer, that "no fair-minded person would find the suspicion of bad faith in the fact of our having licensed the principal parties whom we had sued for infringement." Possibly this statement might be accepted without material qualification if it were the only fact to be considered; but when it is remembered that the suits were between different patentees, each claiming a priority or exclusiveness of right, as against the other, to manufacture and sell barb wire; that by reason of these conflicting claims of right to manufacture, and the large number of parties engaged therein, barbed wire was manufactured and sold by them to wholesalers and retailers at such prices that it was furnished to farmers at from 6 to 7 cents per pound, and that by these settlements and compromises between and among all these nominally adverse litigants, they could and did so arrange it as that each and all of them could continue the manufacture of barbed wire, and could, by their compromises and their decrees or judgments pursuant thereto, so combine that all the barbed wire they should manufacture would be sold at such prices that the farmers would have to pay from 10 to 11 cents per pound, and that thereby each party would derive largely more of profit than could otherwise be realized, even by a complete and full success in the litigation—these facts make the bad faith most conclusively manifest.

Further than this, and as if to illustrate the maxim that "when rogues fall out honest men get their dues," it has come to the knowledge of the public, through the litigation between Washburn & Moen and some of their licensees, and otherwise, that in granting their licenses it was stipulated therein that the licensee should not manufacture more than a certain number of tons per annum (the limit being larger with some than with others); that they should only sell at certain fixed and specified prices, modified uniformly according to the quantity purchased by one buyer; and that the respective vendees should be obligated in and by their contract of purchase to sell to their vendees also at certain specified rates, and these so named and graduated as that barbed wire should cost the farmer ten cents per pound for painted and eleven cents for galvanized wire. The terms and conditions of these licenses entered into the agreements for compromise and constituted one of the inducements thereto, and became the means of forming such a combination as would enable them to make the price of barbed wire to farmers and other consumers from 3 to 4 cents per pound more than it was sold for prior to such compromises and combination. It will thus be seen that by the settlement of the litigation and the combination they formed, each and every party thereto was enabled, by the increase of the price of wire, to derive largely more of profit than by continuing the litigation, even if successful therein. But in order to derive this large profit it was necessary to secure, in some way, a decree establishing the validity of some one or more of the barbed wire patents owned by some of the parties to the litigation and combination. The temptation, under such circumstances, to impose upon and deceive a court by a merely colorable or sham defense or otherwise, as well as the varied means whereby it may be done, are, doubtless, well known to patent lawyers, although they may never have taken out letters patent thereon.

If everything was fair and honest, why, I ask, were the licensees, each and every one of them, limited in the amount of barbed wire each should be allowed to manufacture? Mr. Washburn says, in the communication to which this is intended as an answer, "That the pressure for the material was great, with an immediate demand for all that could be produced." This being true, why were not the licensees allowed to produce all they could? Is there any true answer, except the one, that if they were thus allowed the monopoly combination could not be made successful?

Again, if everything was fair and honest, why were the licensees limited and controlled in the prices at which they should sell their product, the barbed wire? They are required by their licenses to keep and report an accurate account of the barbed wire manufactured by them, and promptly, regardless of any controversy which may arise between them, to pay the ¾ cent per pound royalty. Why not, therefore, let them sell barbed wire at such price as they deem proper? What business is it to, or how does it concern Washburn & Moen, that they shall fix the price at which the licensee must sell his product? If the licensee pays his royalty, and he is bound to, why may he not sell barbed wire at whatever price he pleases? Is it possible to conceive of any reason, except the pecuniary self-interest of parties litigant, which induced them to compromise and form the combination and monopoly—the ultimate end and purpose of it. We find in 1878 and following, numerous parties engaged in the manufacture of barbed wire, and it is sold to farmers at from 6 to 7 cents per pound. Thereupon Washburn & Moen sue 39, more or less, of the manufacturers and claim the exclusive right in themselves to manufacture barbed wire. These suits are pending some time, during which barbed wire continues to be sold for from 6 to 7 cents per pound. In some way, by imposing on the court or otherwise, an interlocutory decree is obtained; but before this decree is entered of record all the litigants but one make a compromise, and shortly after, that one also compromises with the adverse party, and now 40 persons claim, and practically exercise, the exclusive right to manufacture barbed fence wire, and the price thereof, although the price of plain wire has not changed, is fixed for consumers at from 10 to 11 cents per pound. Why this increase of price? It is not because of the increase in cost of the raw material, or of the cost of manufacture; for, by reason of improved machinery, the cost of manufacture is even less than formerly. What is it then that makes the price greater? The only answer is the compromise decrees and the combination which brought them about. If Washburn & Moen had made a *bona fide* contest in court and had established the validity of their patents and recovered legitimate decrees and judgments, they would have granted licenses at a reasonable royalty—say ¾ cent per pound—without limit as to quantity or restraint as to price, and the competition in manufacture would have continued. The only possible effect upon the price, if the litigation had been legitimate, successful and honest, would have been to add the royalty to the former price. Just that and no more. And, but for the combination and the limitations and restraints of the licensees resulting therefrom, there is no reason why we might not have competition and fair prices, even if the Washburn & Moen patents had been sustained by the courts.

It is worse than useless for Mr. Washburn to enter into a pretended analysis of the cost of barbed wire, and thus to show that it is furnished at a reasonable profit to the manufacturer. For the fact still remains, and is a matter of experimental knowledge with the farmers in Iowa and the Northwest, that before the compromise decrees they bought barbed fence wire at from 6 to 7 cents a pound, and now they have to pay 10 and 11 cents per pound for the same wire. And this, too, when there has been no increase in cost of material or of the manufacture. The addition of ¾ cent per pound for royalty does not account for 3 or 4 cents per pound of increase in price; nor can Mr. Washburn by any analysis he can make, nor by any pretense of injured innocence, nor by any "blank contradictions" of everything and everybody, make any reasonable account for this difference in price which everybody knows to exist.

But to show conclusively to the public that Mr. Washburn does not intend fair dealing, or to provide the farmers with barbed wire made according to his patents at a fair price, with a reasonable royalty added, we refer to the fact that he has formed a pool with his licensees. That is, to avoid any secret reduction of prices by the licensees, it has been agreed that the clear net profit to the manufacturers at the prices fixed by the licensees is $30 per ton; that each licensee shall pay to their treasurer that sum per ton for and as each ton is manufactured and sold by him; that, at stated periods, the aggregate of the sums so paid to the treasurer shall be divided between them, not according to the amount paid in by the licensees respectively, but *pro rata*, according to the maximum amount of wire each is licensed to make per annum.

By this arrangement, it will be seen, each licensee is sure to receive his share of the profits of all the barbed wire sold, although he may not have manufactured or sold a

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It having come to the knowledge of JOHN WILSON that Counterfeit Butchers' Knives, purporting to be of his manufacture, are being sold in the United States, he hereby cautions all purchasers of his Knives and Steels to be on the alert against such imposition.

JOHN WILSON also hereby gives Notice, that it is his determination to institute Legal Proceedings against any person or persons who may be detected infringing his Trade Mark.

Every article of JOHN WILSON'S manufacture, bears the Trade Mark, in addition to the Name.

WORKS:—SYCAMORE ST., SHEFFIELD, ENGLAND. Established 1750

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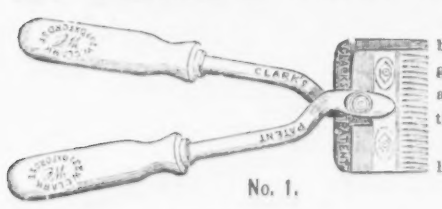
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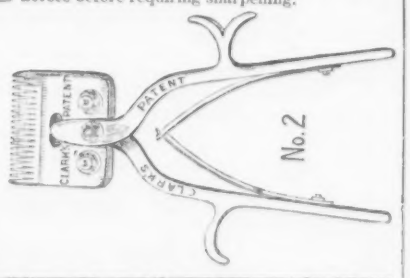
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To be obtained of all Saddlers and Ironmongers, Wholesale of the Patentee,

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All sorts of Hardware and Merchandise for import and export purchased on commission.

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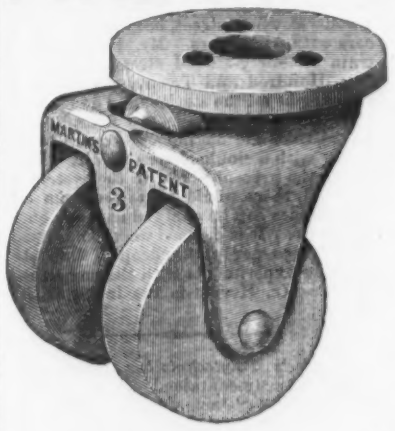
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Maynard's C. S. Planters' Hilling and Bog Hoes; Brady's Crown, Planters' and Hilling; Elwell's Weeding Planters' and Grub, and a variety of other kinds for Home and Export Trade.

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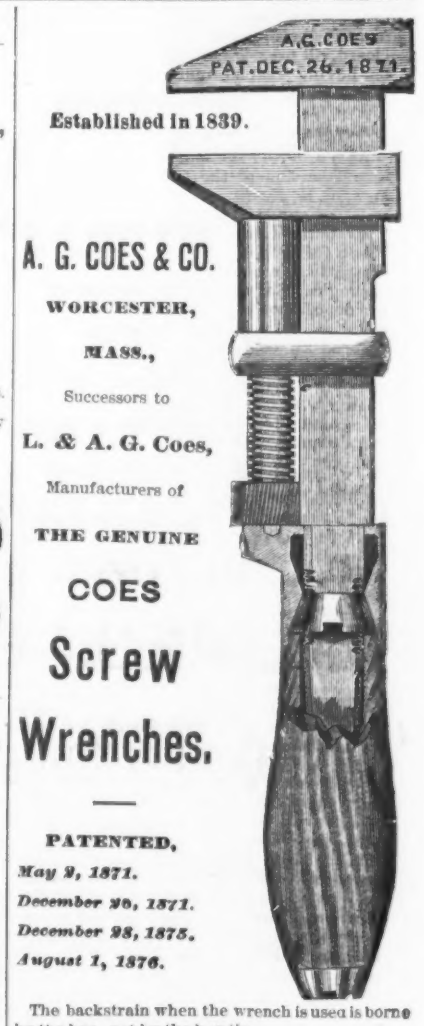
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Recommended as the best Hand Clipper made.

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THE GENUINE

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Screw

Wrenches.

PATENTED,

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The backstrain when the wrench is used is borne by the bar—not by the handle.

The strongest Wrench made, and the only successful Re-enforced Bar.

None genuine unless stamped

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Our Agents, GRAHAM & HAINES, 113 Chambers St., New York, carry a full line of our goods, and will be pleased to serve you at factory prices.

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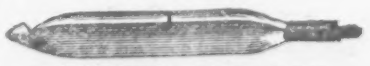
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We GUARANTEE these goods to be SOLID and of UNIFORM quality throughout, with no coatings to wear through or flake off, and with no liability to RUST.

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Finest Quality Silver-Plated Spoons, Forks, Knives, &c.

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NOTICE.—We guarantee the base of our Spoons, Forks, &c., to be full 18 per cent. Nickel Silver, and **extra heavily plated with pure Silver.** Our goods are all hand burnished, and are **first-class in every respect.** We pack our Spoons and Forks one dozen in each box.

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Representing THE LEE ARMS CO., C. S. SHATTUCK, THE GREENFIELD CO-OP. WORKS, ATLAS WORKS, J. K. RUPERTUS. THE MILLVILLE SHEAR CO.



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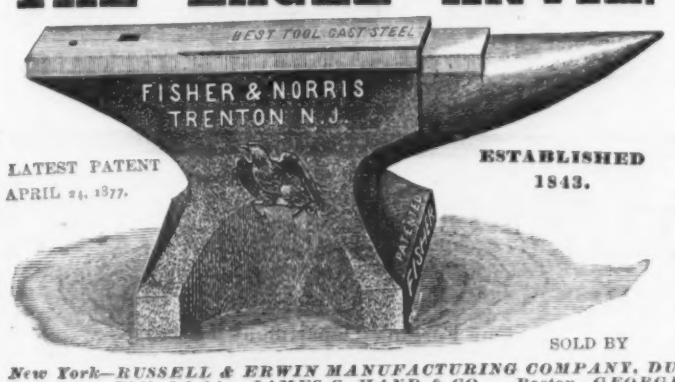
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THE "EAGLE" ANVIL.



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WARRANTED!!

Better than the Best English Anvil.

Face in one piece, of BEST TOOL CAST STEEL. PERFECTLY WELDED, perfectly true; of hardest temper and never to come off or "settle." It does not bounce the hammer back, and therefore can do more work with lighter hammer. Horn of tough *untempered steel*, never to break or bend. *Only Anvil made in United States fully warranted as above. None genuine without our trade-mark.*

N. B.—That the ***"Eagle" Anvil*** is the ***only*** one made at Trenton, New Jersey, and it must not be mistaken for an Anvil in the market called Trenton, but which is really of foreign manufacture, and an imported imitation of the English Anvil.

New York—RUSSELL & ERWIN MANUFACTURING COMPANY, DURRIE & McCARTY, TENNIS & WILSON.
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HOOSIER SAW WORKS.



W. B. BARRY, Indianapolis, Ind.

Circular Saws.

I use none but best refined cast steel, selected. All saws subjected to a careful examination before shipment.

A trial of our goods will satisfy the purchaser of their excellence.

Send for catalogue.

single ton of it, and hence every inducement to cut or reduce the price below that fixed by the licensees is fully met and obviated. In other words, Mr. Washburn has organized a barbed wire manufacturers' "pool," and then appeals to *The Iron Age* to protect him from certain parties whom he alleges are "seeking to prejudice the community against us." The substantial facts as herein stated are taken from the record in the case, here now being defended by the Farmers' Protective Association.

In the communication to your paper of the 13th inst., Mr. Washburn "utterly disclaims" having made any such statement to a committee of farmers in Des Moines as I had attributed to him in my former letter to you, published in *The Iron Age* of date September 22, ult. I inclose you herewith the original of a statement proving that Mr. Washburn did use the identical words attributed to him by me in my former communication. You will bear me witness that I did not say his statement was true. I left that for him to contradict or establish. I do not know whether the farmers credited that statement or not; but I think I do know they did discredit some other statements made by him at the same interview. The statement is as follows:

We, C. F. Clarkson and B. F. Gue, do severally state and declare, each for himself, that we were present at an interview between Mr. Washburn, of the Washburn & Moen Mfg. Co., and a committee of farmers of Iowa, had at the office of the *Homestead*, in Des Moines, Iowa, May 27, A. D. 1881, at which Judge C. C. Cole was also present, and that at such interview Mr. Washburn stated, among other things, to the committee of farmers, "that there were sold in Iowa during the last year over 150,000 tons of barbed wire." C. F. CLARKSON,
B. F. GUE.

The persons who make the foregoing statement are second to none in Iowa in either moral, social or business standing. Mr. Clarkson has been for two terms a member of the Iowa Senate, and is now the agricultural editor of the *Iowa State Register*, and Mr. Gue has been Lieutenant-Governor of this State, and is now the editor of the *Iowa Homestead*. Their integrity or veracity will not be questioned by any man in Iowa or elsewhere.

It may, however, be fairly due to Mr. Washburn, whom I have met and for whom I entertain very great respect, that I state, as the result of my observation as a man, a lawyer and a judge, that frequently a person utters language different from that he intended and supposed he did utter, and that it as frequently happens that the language uttered by a person is understood and remembered by the hearer different from that which he actually did utter. Whether Mr. Washburn made the statement different from what he intended, or whether it was misunderstood or misremembered by those who heard it, is a matter of no sort of materiality or consequence. The whole gist of the controversy, so far as relates to this point, is whether the Washburn & Moen Mfg. Co. are using their pretended patents fairly and for the sole purpose of obtaining a reasonable royalty only, or are using them for the purpose of monopoly and extortion. That they are using them for the latter purpose is as much and fully proven by showing that they have a monopoly and are selling barbed wire uniformly at a fixed price above a reasonable royalty, although the amount sold may be only 5000 tons instead of 150,000. The personal guilt of those doing it and the personal wrong to each purchaser is just the same in the one case as the other. The fact (if it be such) that the extortion may only aggregate in Iowa $1,000 000 instead of $9,000,000, does not relieve from the guilt of the act or the just odium which properly attaches to it; nor does it relieve the Farmers' Protective Association from its obligation to resist the wrong by every proper, legitimate and lawful means within its power.

I must be permitted, however, to question the veracity of Mr. Washburn's new estimate of the total amount of barbed wire sold in 1880, as well as the estimated amount sold in Iowa during the same time. The quantity authorized to be manufactured by Mr. Washburn in his granted licenses is entirely at variance with his recent estimate. The Farmers' Protective Association therefore submit to *The Iron Age* and to the disinterested and considerate public that they have grievances against the Washburn & Moen Mfg. Co. because—

1. They are not inventors nor patentees, but mere speculators in patents, and, as such, have purchased many of the earliest barbed wire patents, not for the purpose of aiding the patentees or of benefiting the public, but for speculation solely.

2. That they have not frankly and fairly submitted their patents to the judgment of the courts in an open and *bona fide* contest between actually adverse litigants.

3. That they have evaded and avoided the submission of their patents to *bona fide* judicial investigation, and have by agreements and compromises sought to obtain such decrees and judgments as would enable them to make the public believe that the courts had adjudicated the validity of their patents when no such final adjudication had ever been made.

4. That they have by their compromises and agreements with the parties whom they have made defendants in their several suits and otherwise, limited the manufacture of barbed wire and enabled themselves to control the price to the farmers.

5. That they have also by their compromises, licenses and combinations, organized a barbed-wire monopoly, and have fixed an unreasonable and extortionate price therefor, and are now oppressing and robbing the farmers by means thereof.

In conclusion, permit me to say that the Farmers' Protective Association did not organize for the purpose of resisting the law, of opposing valid patents, the patent law or manufactures of any kind, but for the purpose, *inter alia*, of securing a full, fair and *bona fide* adjudication by the courts upon the validity of the patents for barbed wire claimed by the Washburn & Moen Mfg. Co., and to secure to farmers the right and privilege of purchasing barbed wire at a fair and reasonable price in open market.

Very respectfully, C. C. COLE.

Machinery Belts.

Fast belt speeds are better than slow ones for many reasons; one is, they are less liable to slip, and the grip is much better. Fixed pulleys should have a convexity of about one-tenth their breadth, or less. This keeps the belt in place while the machine is in proper action. One advantage of belt transmission is that connections may be very readily established or broken at any distance and under any circumstances. Cast-iron pulleys give less belt grip than wooden ones, or than the same covered with a lagging of paper or leather. A perfect belt should be perfectly straight, and of even thickness throughout, with but one laced joint, the rest being scarfed together permanently. The ends that are laced together should be cut off square, and the lace holes made by an oval punch, the longest diameter of the hole lengthwise with the belt. The lacing should be strong and regular, put in evenly, all the crossings on outside. Rivet heads should be on inside and washers outside, and the heads should be let in flush with the face of belt.

Horizontal belts drive better than inclined, and still better than vertical, and long ones drive better than short ones. Loose belts last longer than tight ones. Tighteners should be used as little as possible, but if they are necessary they should be large and free running, and applied to the slack side of the belt.

For moist situations, leather belts, if used at all, should be of the finest and firmest leather that can be had. You may have a very good belt and a very poor pulley, and be losing power from that reason. The best leather belts are oak-tanned. There is some belting in the market which is chemical-tanned, but colored in imitation of oak.

Coned pulleys, if made for crossed belts, should have all the steps alike, and in this case the belts will run on equal tension and not bear on steps; but an open belt requires steps especially laid down. The proper construction of such cones or steps cannot be shown here without a diagram.

As far as possible, in laying out the belting for a mill, the pulleys should be so arranged that the stress of one belt upon the journals may be counteracted by another in the opposite direction. Belts are superior to gears for the transmission of power in all cases where the power is irregular. Belts have the disadvantage of needing more frequent repairs than gears, and of having to be renewed much more frequently. They should not be too strong. They should be strong enough to carry all the power that is required of them, but weak enough to break before the shaft or pulleys. Wood-working machinery belts generally have less driving power than others where they can remain soft and pliable, as the fine wood dust chokes up their pores and lessens their pliability.

In nearly every case we find circular saws driven by belts which are too narrow, or with pulleys which are of too small diameter. In consequence, we find that the bearings become heated by the excessive sudden strain upon them. No circular saw (except, perhaps, a cross-cut) should be driven by a belt which is in width less than one-third the saw diameter, and the pulley should be of the same diameter as the belt—thus, a 60 inch saw should have a 20-inch belt on a 20-inch pulley, and the 72-inch saws of the Northwest should have 24-inch belts upon 24-inch pulleys. There is no trouble about remembering this rule. Cross-cutting spindles may have only one fourth the saw diameter in width. The amount of actual belt contact is very much less than what a diagram would show—sometimes very little more than one-half as much.

Cotton belts are especially advantageous for high speeds, because they are light, and lift very little by reason of centrifugal force.

The wider a pulley is the less the amount of crown per inch of width there should be. Generally belts running from a large to a small pulley slip on the large one. Belts made from young hides are better than those made from hides of old animals. Good hides may be spoiled in the currying. Leather belts weigh when new about 60 pounds per cubic foot. After that they get a very little heavier.

Where narrow belts are used on small pulleys, the shafts should be about 15 feet apart. For larger belts larger pulleys, 20 to 25 feet will do. Where there are very large pulleys, 25 to 30 feet will answer. If the distance between the shafts be too small, there will not be enough sag to the belt to make it tight; and if they be too far apart, there will be too much tension upon the belt and too much pressure upon the bearings.

Where a quarter-twist belt is to be run between two shafts at right angles with each other, and not in the same plane, the distance between the nearest faces of the pulleys must not be less than four times the belt width, and a plane passing through the center of the faces of one pulley must be tangent to that part of the faces of the other, from which the belt is running. The pulley from which the belt deflects must have a wider face than the other, and have more crown than usual.

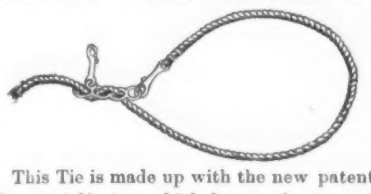
Where the shafts are at right angles but not in the same plane, and the belt runs on three pulleys, one of which is a tightener, there may be very short distance between the two shafts.

To lay out quarter-turn belts, draw on the floor with chalk two full-sized pulleys and the position of the floor, and measure this correctly, and then if desirable transfer to paper on a smaller scale. There should be some allowance for the sag of the slack sides of the belt. In cutting the holes through the floor, use string or tape between the the two pulleys, passing through trial holes in the floor.—*Robt. Grimshaw.*

Among the many branches of business which have recently received an impulse is the manufacture of emery, and the various tools and forms by which it is rendered effective. The increased amount of iron-work in the construction of machinery, stoves, &c., has greatly increased the consumption of this article, which is essential in all sorts of iron finishing. The emery factories are busy, and it is with difficulty that the supply can be kept up. The natural result is an advance in the price of the article to the extent of about 10 per cent.

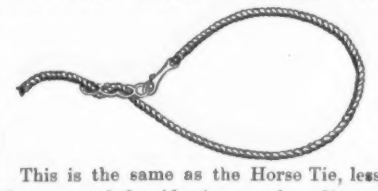
COVERT MANUFACTURING COMPANY,

Covert "O. K." Horse Tie



This Tie is made up with the new patent Covert Adjuster, which is superior to any article in use for the same purpose, and is much cheaper.

Covert "O. K." Cattle Tie



This is the same as the Horse Tie, less the snap and the side ring on the adjuster for its attachment, and also the usual difference in the length of the rope.

COVERT WEIGHT CORD.

This cord is made of 5-16 in. solid braided black cord, with Covert Snap attached, very neat in appearance and exceedingly strong and durable. The low figure at which the price is placed renders it far more economical than leather.

COVERT DRIVING REINS.

Made with the Covert Snaps and Adjuster. Laps and ends clamped with steel rings. The cross lines easily adjusted and firmly held at any length desired. Made of best 5-16 in. Cotton and Jute Cord.

COVERT HITCHING CORD.



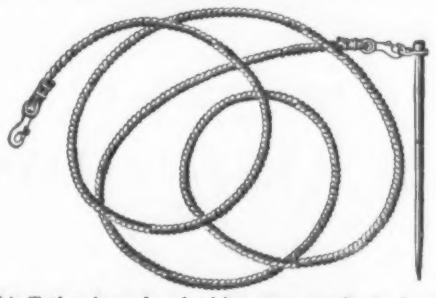
This cord is made of 5-16 in. solid braided cord with Covert Snap at each end, and the Covert Adjuster, as appears in the cut. It is used by snapping one end in the bit and the other end in the adjuster, thus obviating the trouble of tying.

SOLE MANUFACTURERS OF



COVERT'S PATENT HARNESS SNAPS,

Covert Lariat Tether & Picket Pin.



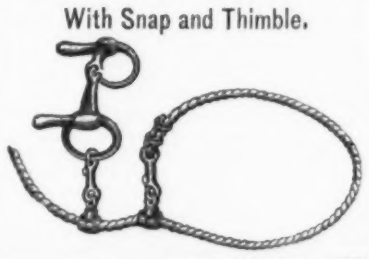
This Tether is made of ½-in. rope, 30 ft. in length, with the Covert Swivel Snap at each end, clamped on with the steel ring clamp. The pin is 15 in. in length, with a movable swivel attachment at the head, which, in connection with the swivel snaps, renders impossible any twisting, kinking or tangling of the rope.

CHAIN AND ROPE GOODS

ROPE HALTERS, HORSE AND CATTLE TIES, HALTER LEADS, &c.

These goods are sold by all leading jobbers in General and Saddlery Hardware, and the same discounts given from the list to the trade as when purchased direct from the factory.

Covert Rope Horse Tie,
With Snap and Thimble.



All Manufactured by Machinery, and are the Best and Cheapest in the World.

SEND FOR ILLUSTRATED CATALOGUE AND PRICE LIST.

COVERT MANUFACTURING CO.,

West Troy, N. Y.

COVERT CATTLE TIE.



This is the same as the Horse Tie, less one Snap and Thimble, and has eight and one-half feet of rope instead of ten.



We have invented a new style of Knife Handle, and applied for a patent on same. It is light, exceedingly strong, and can never get loose. We have plated this knife with a composition plate, and we warrant it to wear as long as the VERY BEST silver plate, and to look as well after two months' use. The price is so extremely low that the poor need scour knives no longer. We have for three years warranted our Butcher Knives to be superior to any other Butcher Knives on earth, and this warrantee has never been disputed to our knowledge by anybody who has ever tried them, and our statement about these knives will prove equally reliable. We will send 12 knives and 12 forks by mail, postpaid, on receipt of $3. We make a very handsome Butter Knife, heavily plated with silver, at an exceedingly low price. We also make a full line of Hot Water Proof Table Cutlery, which has very rapidly gained in popularity for the past three years, and is having an unprecedented sale at the present time. We make eleven different styles of Carvers. The cutting quality of the blade is the same as that of our Butcher Knives. The fork guard is patented by us, and made by nobody else, and is highly admired by the trade. We are having a large sale now, but we desire to increase it. Give us a chance to prove our statements.

GOODELL COMPANY, Antrim, N. H.

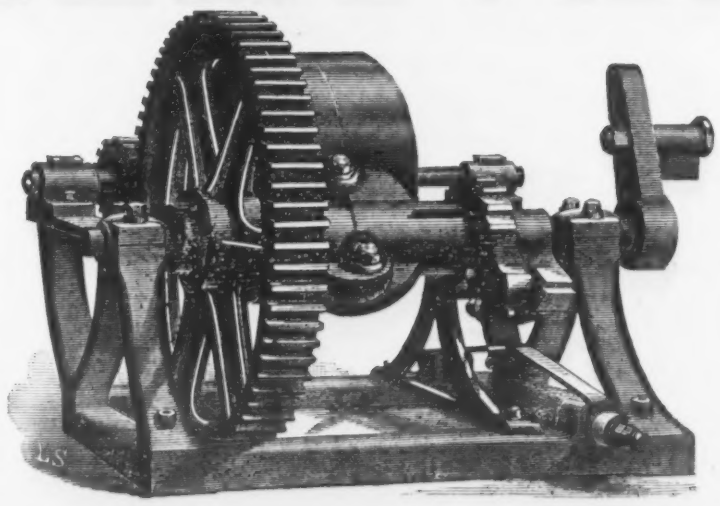
REMOVAL.

NEW HAVEN, CONN., July 15, 1881.

DEAR SIR: We have removed our works to our new factory, corner Lloyd and River Streets, Grapevine Point, where we have increased facilities, not only for the production of the

Peck Patent Drop Press,

but also for the manufacture of Drop Dies, Drop and Machine Forgings and Special Machinery.



Our Forging Department is fitted out with the latest improved tools.

We are prepared to quote prices for the manufacture, by contract, of specialties in the Drop Forging line. We have also facilities for furnishing heavy Machine Forgings, such as Cranks, Connection Rods, Drop Die Blocks, Heavy Dies, &c.

Thanking you for past favors, and hoping to receive a continuance of same, we remain, yours respectfully,

BEECHER & PECK.

DE-OXYDIZED BRONZE.

DE-OXYDIZED BRONZE (patented) is an alloy of **LAKE COPPER** and best **ASIATIC TIN** in any proportion required, so as to be either as **ductile as copper, as tough as iron, or as hard as steel,** according to the proportion of Copper and Tin used.

The **process** of making the alloy is what constitutes its superiority over any other known alloy of Copper and Tin or any other Bronze composition. The castings made from this metal, owing to its perfect fluidity when melted, possess great density, perfect soundness and homogeneity. Unlike certain bronze and other compositions, it can **be handled without the least difficulty by any ordinary founder,** as it flows like oil in pouring.

Thus the necessity and trouble of shipping patterns, the delay in receiving castings and the expense of the double charges of freight or express, such as attend the obtaining, in many cases, of Phosphor Bronze, are entirely avoided by ordering **D. O. B. in ingots.** Where this metal has superseded other compositions of similar character, it **has endured three times as long.** In a word, we claim that **De-Oxydized Bronze** not only has none of the objectionable features attributed to similar compositions, but that it possesses all their good qualities in addition to its own merits, and advantages peculiar to itself, such as the following summary will make clear:

1. **ITS GREAT CONVENIENCE IN HANDLING as compared to Phosphor Bronze.**
2. **We claim for it SUPERIOR ANTI-FRICTION QUALITIES to any other known Brass or Bronze.**
3. **GREAT MALLEABILITY AND TENACITY.**
4. **Its homogeneousness and smoothness of surface render it capable of the HIGHEST POLISH.**
5. **As before mentioned, we claim for it UNEQUALED ENDURANCE.**
6. **We claim that JOURNALS MADE of D. O. B. REQUIRE ONE-FOURTH LESS LUBRICATING MATERIAL than any other composition yet known.**

Finally, this metal has never failed to give more than satisfaction wherever used. To sustain our statements, the following testimonials will suffice:

Henry Disston & Sons, Saw, Tool, Steel and File Works, Front and Laurel Streets,

Philadelphia Smelting Company, City: PHILADELPHIA, October 4, 1879.

GENTLEMEN: After a trial of eighteen months of your "DE-OXYDIZED BRONZE" as Journal Boxes in our Rolling Mill, where great pressure is required we take pleasure in recommending it as being superior to any we have heretofore used. Very truly, HENRY DISSTON & SONS.

Office of Eagle Iron Works, 1162 North Third Street,

Philadelphia Smelting Company: PHILADELPHIA, August 29, 1879.

GENTLEMEN: In reply to yours of the 28th inst., we beg to say that we have been using your "DE-OXYDIZED BRONZE" for over a year, and have found it better than any composition boxes we have used; and as long as you continue to make it the same quality, we shall use no other metal in our Engine Boxes. We therefore take pleasure in recommending it to Engine Builders in general.

Yours respectfully, HOFF, FONTAINE & ABBOTT.

Office of Union Brass Manufacturing Company,

CHICAGO, Dec. 23, 1880.

Philadelphia Smelting Company, Limited, Twelfth and Noble Streets, Philadelphia, Pa.:

DEAR SIRS: In reply to your inquiry of yesterday as to our opinion of "DE-OXYDIZED BRONZE" for Railway Coach Trimmings, I beg to submit that we have used it up to present writing for the trimming of something over 100 coaches. One marked peculiarity of this metal, when highly finished, is non-liability to abrasion, and its non-affinity with the gases of the atmosphere, which in embossed work is a great desideratum. To those willing to pay more in the first cost, we would confidently recommend "DE-OXYDIZED BRONZE" Trimmings as cheaper in the end. Yours very truly, J. HALL DOW, President.

This metal is used for the following purposes, and we can refer to large concerns in addition to above, through the New England and Middle and Western States, who are using it in preference to any other.

1. **Engine, Car and Machinery Journals.**
2. **Pumps, Valves and Linings, Cylinders, Pinions, Cogs, Plungers, Crank Pins, &c.**
3. **Car Trimmings, Harness and Coach Furniture, House Hardware, Steam Fittings, &c.**
4. **Wire, Sheets, Rods and Tubes.**

And for any other purpose that a **handsome, durable and sound** Bronze is required. We especially commend it to **Railroad Companies, Car Builders, Machinists, Engineers** and others requiring a **Journal Metal** that will stand the **severest friction** and the **heaviest pressure.**

Manufactured and for sale in Ingots and Castings by the

PHILADELPHIA SMELTING COMPANY, Limited,

S. E. COR. TWELFTH AND NOBLE STS., PHILADELPHIA, PA., U. S. A.

GENUINE BABBITT.

Our Genuine Babbitt is superior to all other makes in the market in every particular. We guarantee it to be perfect in its Anti friction qualities in machinery AT A SPEED OF **10,000** PER MINUTE, or at **1000** TONS PRESSURE for **10** YEARS. We append below testimonials from A1 houses justifying us in the above claims.

NEW HAVEN, CONN., April 11, 1881.

We have used your "Genuine Babbitt" in our Challenge Rock Breaker with excellent results, and are pleased to testify to its merits for Journals, where high speed and great pressure are required.

BLAKE CRUSHER CO.

WORCESTER, MASS., April 21, 1881.

We have used your "Genuine Babbitt" about 4 years on our wood cutting machinery bearings, run at a speed of 9800 revolutions per minute, and always with entire satisfaction.

G. W. INGALLS & CO.

WORCESTER, MASS., April 23, 1881.

Having used your "Genuine Babbitt Metal" for over 4 years on machinery that runs over 9000 turns a minute, on 1 in. shaft, 3 in. journals, I can safely recommend it for all you advertise it to do. Any person wishing to see the machinery or wanting further information can call or address,

A. L. THOMPSON, Master Mechanic, 25 Harmon street.

From J. L. MARSDEN, Supt., FARRELL FOUNDRY AND MACHINE CO., ANSONIA, CONN., Aug. 17, 1880.

The "Genuine Babbitt" we have bought from you gives perfect satisfaction in our Stone Breakers. We have it working in bearings 12 in. long and 5 in. diameter. One-half the revolution of shaft there is a pressure of 900 tons. The other half 2½ tons. The shaft makes from 200 to 250 turns per minute. I think this is a very severe test, yet they have been running for more than one year.

From WITHERBY, RUGG & RICHARDSON, Manufacturers of WOOD-WORKING MACHINERY, WORCESTER, MASS., NOV. 29, 1880.

Send us 1000 pounds "Genuine Babbitt," divided into Bars, as usual. We think the continuance of our trade with you, in the face of the constant effort made by other parties to divert our patronage, is a sufficient recommendation of your goods. We speed some journals as high as 6000.

Yours truly, WITHERBY, RUGG & RICHARDSON.

From this it will be seen that it can have no superior, or even equal, as an Anti-Friction Metal in anything manufactured. We make besides all grades of Anti-Friction Metals,

Letter A, Guaranteed at a speed of 2000.
Letter B, Guaranteed at a speed of 1000.
Letter C, Guaranteed at a speed of 800.
Letter D, Used for Shafting.
Letter E, Used for Ag'l Implements &c.
Letter A L, For slow speed.

All our Metals are made from best Lake Copper, Asiatic Tin, Cookson's Antimony and best Refined Lead, and in all cases run free at melting heat, without drossing, and without any necessity for heating the journals into which they are poured.

MANUFACTURERS' AND MACHINISTS' NAME PLATES,

REAL BRONZE, FINISHED.

Patterns from $3 upwards, according to Size and Style. Plates, $3 per dozen and upward, according to Size and Style.

SKETCHES FURNISHED FOR APPROVAL BEFORE MAKING PATTERNS.

We have a specialty in this line and produce a handsomer plate, at less money, than can be obtained elsewhere.

ART AND ECCLESIASTICAL METAL WORK IN BRASS AND BRONZE,

GAS FIXTURES, ALTAR CANDLESTICKS, SANCTUARY LAMPS, CHANCEL RAILS, PULPITS, &c.

PHILADELPHIA SMELTING COMPANY, Limited,

S. E. COR. TWELFTH AND NOBLE STREETS, PHILADELPHIA, PA.

Varnish on Metal Surfaces.—To make alcoholic lacquers or varnishes adhere more completely to polished metal surfaces, one part boracic acid should be added to 200 parts of varnish. This composition will adhere so firmly and become so completely glazed as to be removed only with difficulty. Be careful not to add too much of the boracic acid, as it injures the gloss in that case.

Emery paper is frequently found lacking in retaining an equal efficiency, the fresh parts biting too much, and the paper getting soon worn through in many places. Emery has been tried on linen, but with little success. A paper or board has been recommended in which emery enters as a constituent part. It is advised to employ fine and uniform cardboard pulp, with from one-third to half its weight of emery powder thoroughly mixed with it, so that the emery may be equally distributed. The mass should be poured out into cakes of from 1 to 10 inches in thickness. They must not be pressed hard. Such a paper, it is said, will adapt itself to the form of the articles, and will serve until completely worn out.

Special Notices.

SECOND-HAND & NEW MACHINERY

November, 1881.

The following New and Improved Machinists' Tools are part of what we have for future delivery:

6 22-in. swing, 12 ft. bed, Engine Lathes. October.
1 22-in. swing, 15½ ft. bed, Engine Lathe. November.
1 22-in. swing, 11½ ft. bed, Engine Lathe. November.
1 22-in. swing, 8½ ft. bed, Engine Lathe. November.
3 18-in. swing, 10 ft. bed, Engine Lathes. October.
3 18-in. swing, 8 ft. bed, Engine Lathes. October.
2 15-in. swing, 6 ft. bed, Engine Lathes. October.
2 28-in. swing, Upright Back Geared Drills. October.

The following for prompt delivery:

1 21-in. swing, 10 ft. bed, Turret Head Lathe.
1 20-in. swing, 13 ft. bed, Engine Lathe. Second hand.
1 18-in. swing, 10 ft. bed, Engine Lathe. New.
2 18-in. swing, 8 ft. bed, Engine Lathes. New.
1 19-in. swing, 6 ft. bed, Engine Lathe. New.
1 16-in. swing, 7 ft. bed, Engine Lathe. Second-hand.
1 15-in. swing, 5 ft. bed, Engine Lathe. Second-hand.
1 13-in. swing, 5 ft. bed, Engine Lathe. Second-hand.
1 12-in. swing, 4 ft. bed, Engine Lathe, Second-hand.
1 12-in. swing, 6 ft. bed, Engine Lathe. Second-hand.
1 12-in. swing, 4½ ft. bed, Hand Lathe. Second-hand.
1 10-in. swing, 4½ ft. bed, Hand Lathe. Second-hand.
1 9-in. swing, 3 ft. bed, Hand Lathe. Second-hand.
2 7-in. swing, 3 ft. bed, Hand Lathes. Second-hand.
1 36 in. swing Pulley Lathe. New.
1 Round Arbor Fox Lathe. Back geared. 2d hand.
1 36-in. x 36 in. x 11 ft. Planer. New.
1 12-in. x 12 in, x 2 ft. Planer. Second-hand.
1 6-in. Shaping Machine Heavy. Second-hand.
2 24-in. Harris Upright Drills. Second-hand.
2 Wall Drills, heavy. Second-hand. 60 and 72 in.
1 Pratt & Whitney Cam Cutter, 2 heads. Second-hand.
2 Milling Machines, Lincoln pattern. Second-hand
2 Manhattan Arms Co. Millers. Second-hand.
1 Pond Index Milling Machine Vise and Centers.
1 Face Milling Machine. Second-hand.
1 Pond's Double Milling Machine. Second-hand.
1 Garvin Milling Machine. Second-hand.
1 Screw Head Slotter. Second-hand.
4 Second-hand Profiling Machines.
1 Cock Grinding Machine. Second-hand.
1 Vertical Centering Machine, nearly new.
3 Emery Grinders. Second-hand.
1 Sellers Tool Grinder. Second-hand.
1 Pipe Cutting Machine. Second-hand. 2 inch.
1 Bolt Cutter, 1¼ in. New Taps and Dies.
1 Bolt Pointing Machine. Second-hand.
3 Pulley Fording Machines. Second-hand.
1 Pattern Lathe 27 in. swing, 14 ft. bed.
1 Upright Boring Bar, 4½ in. diam., self-feed. Second-hand.
1 Hor. Boring Bar, 1¾ in. diam., Self-feed, 2d-hand
1 Hor. Boring Machine, 30 in. swing, 13 ft. bed.
1 Hor. Boring Machine, small. Second-Hand.
2 Horizontal Boring Machine, 4 spindle. 2d-hand.
1 Betts No. 2 Power Punch. New.
6 Double-Acting Presses, No. 3, nearly new.
4 Single-Acting Presses, for power, nearly new.
12s Foot Presses, nearly new.
1 Bliss & Williams' Power Punch, nearly new.
1 Medium Power Punching Press. Second-hand.
2 Small Power Punching Presses. Second-hand.
1 Foot Punch, with bench. New.
1 Lot Pistol Machinery. Second-hand.
2 Grind Stones and Frames. Second-hand.
1 Richards' Indicator.
1 Crane. Second-hand. 20 ft. jib.
Lot of Forges, 1 Jig Saw, 1 Double Saw Bench, 1 Band Saw, 1 Buzz Planer, 1 Slat Tenoner, 1 Railway Saw Bench, 1 Foot-power Circular Saw.
Cold-Rolled Shafting, Pulleys, Hangers, Couplings, &c., always in store.

The Geo. Place Machinery Agency,
121 Chambers and 103 Reade Sts.,
NEW YORK.

The Sherman Process Co.

9 Pemberton Square, Boston, Mass.,

Issue Licenses to use the Process for the Manufacture of Iron and Steel

In the Bessemer Converter, Crucible, Siemens-Martin, Puddling, Blast and Cupola Furnaces.

The use of this Process improves the quality of the product, saves fuel and labor, and does not require any change in furnace or manner of working. See page 17 of *The Iron Age* of Oct. 25th, 1877.

$25,000 Wanted.

A practical mechanical partner, to purchase one-third interest in a large, well known and flourishing manufacturing business in Philadelphia. A rare opportunity is here presented for a young mechanic to enter a business established for 20 years. Address, with full name and address, A. B. D., Office of *The Iron Age*, 220 S. 4th st., Phila., Pa.

Wanted.

VERTICAL BORING AND TURNING MILL, new or second hand, to swing 7 to 12 feet. State maker, time of delivery, price, age, condition, and where it can be seen. Address
N. PORTZ & CO.,
Fostoria, Ohio.

MINING ENGINEER WANTED

to take charge of one or more Hematite Ore Mines, in a healthy location. Must be experienced, of good habits, and thoroughly acquainted with mining in levels and on surface. State full particulars as to age, experience, and where formerly operating. Address,
MINING ENGINEER, Box 25,
Office of *The Iron Age*, 83 Reade st., New York.

WANTED—HARDWARE.

A purchaser for a wholesale Hardware House already established, and doing an excellent business, situated in the city of Cincinnati. The business as a whole or a controlling interest, can be obtained. The Great Southern Railroad, leading into the heart of the South and Texas, opens up such an extensive territory that the business can be enlarged as capital and desire may dictate. A satisfactory showing can be made to any parties wishing to consider the purchase. Address, T. T. MOORE,
Office of *The Iron Age*, Cincinnati, O.

FOR SALE.

Pulley Lathe, built by N. Y. Steam Engine Co., double ended, swings up to 6 ft. Boring Mill, double column, 5 ft.; 80 and 300 H. P. Corliss Engines; new 40 H. P. Vertical Boiler, ⅝ in. flange iron; Pulley, 9 ft. 10 in. face; Pulley, 7½ ft. 15 in face. Lot Woodworking Machinery, Pulleys, &c.
A. G. BROOKS & WINEBRENER,
261 N 3d st., Philadelphia.

Special Notices.

New and Second-Hand

MACHINERY.

One Horizontal Engine, 3 in. x 6 in.
One Beam Corliss Engine, 500 H. P.
Portable Engines from 15 to 25 H. P.
Two Horizontal Return Tub. Boilers, 100 h. p. each.
One Hor. Tubular Boiler, 6 ft x 14 ft. 67 4-in. tubes.
Two Hor. Tub. Boilers, 4½ ft. x 13½ ft., 43 4-in. tubes
One Locomotive Steel Boiler, 30 h. p.

MACHINISTS' TOOLS.

Two Lathes, 14 in. x 4 ft., 4 in. bed.
One No. 2 Woodward Pump.
Five Lathes, 22 in. x 12 ft. New.
Five Lathes, 18 in. x 8 ft. New.
One Lathe, 17 in. x 8 ft. Lincoln.
Two Lathes, 16 in. x 6 ft. Wood & Light.
One Lathe, 16 in x 6 ft. Blaisdell.
One Planing Machine, 36 in. x 8 ft.
One Milling Machine, No. 4. Wood & Light.
One Burleigh Rock Drill, No. 4. New
One Pipe Cutting Machine.
One Styles & Parker Foot Press.
One Bliss & Williams Foot Press.
One Peck, Stow & Wilcox Foot Press.
One Cameron Steam Pump, No. 2.
One Knowles Special Pump, No. 7.
One 6 in. Tapping Machine, D. Saunders' Sons.
One Daniels Planing Machine.
One 100-ton Hydraulic Press and Pump.
One Root Engine.
One Pipe Cutting Machine.
One pair Paper Rolls.
A large stock of Shafting, Pulleys, Hangers, Vises (Wrought and Cast), and other Miscellaneous Machinery.

J. GRAY'S MACHINERY DEPOT,
37 Dey Street, New York, U. S. A.

For Sale.

STEEL WORKS.

The Gautier Steel Department of Cambria Iron Co. offers for sale the buildings lately occupied by Read & Thaw, at North and Irwin avenues, Allegheny, Pa., comprising two-story brick, 40x100; one-story iron-clad, 40x80, and sundry small buildings and attachments upon a triangular piece of property, 210x220x311 (about). Also the engine (120 H. P.) and boilers, shafting, hangers, pulleys, furnaces, wagon scales, some miscellaneous machinery and a complete plant for making steel castings or crucible ingot steel. One of the most desirable and economical manufacturing plants about Pittsburgh. Railroad siding to door of shipping room (P. Ft. W. & C. R. R.). Long lease and small ground rent. Light taxation. Cheap and convenient coal supply. Admirably adapted to foundry, machine, plow, or wood-working shop, or for almost any manufactures of metals or wood. Under judicious management, can be secured free of ground rent. Possession at once, if desired. For further particulars apply to Chas. H. Read, on the premises.
PHILIP E. CHAPIN,
Gen. Supt. Gautier Steel Dept. of Cambria Iron Co.

Wanted.

An Experienced Mechanical Draughtsman.

Address, THE BURDEN IRON CO.,
Troy, N. Y.

Wanted.

A BLAST FURNACE FOUNDER.

Address, THE BURDEN IRON CO.,
Troy, N. Y

J. SIEDEL,

Commission Merchant,

Box 662, Habana, Cuba.

Will be happy to accept the representation of first-class houses manufacturing hardware.

Reference:
COLLINS & CO, 212 Water Street, New York.

FACTORY FOR SALE.

The Clintonville Agricultural Works, at Northford, Conn., eight miles from New Haven, near the station on the Boston and New York Air Line Railroad. Suitable for Hardware or kindred manufactures. Complete with engine, boiler and turbine wheel. Property consists of about four acres with water privilege. Foundry and Blacksmith Shop, Engine and Boiler House, also three-story building with elevator, store house, iron sheds, &c Apply to HORACE P. HOADLEY, New Haven, Conn., or CARR & HOBSON (Limited), 47 Cliff St., New York.

FIRE.

Having lost a Hardware Store, with books, catalogues, price lists, discount sheets, &c., by a conflagration on the 6th inst., and being desirous of entering again into the business, I hereby ask manufacturers and jobbers to send me new catalogues, discount sheets, &c.
A. N. BEADLE, Agent,
Hardware and Implement Dealer,
Pulaski, N. Y.

POSITION as Superintendent (or Foreman in a large establishment), by one that has had large experience; is a practical machinist and tool maker. A 1 references.
Address S. C. LEWIS, 813 Sackett Street, Brooklyn.

Special Notices.

For Sale.

320 Acres of Valuable Coal and Mining Land,

in the lower part of Ward township, Hocking County, Ohio, on a branch of the C. & H. V. R. R.
Address, W. D. CARTER,
Newark, N. J.

For Sale.

The Industrial Works of Shamokin, owned and successfully carried on for a number of years by the late Wm. Brown, deceased, consisting of Foundry and Machine Shop, and a large stock of Patterns regarded as part of the property. Boiler Shop, Blacksmith Shop and Factory for the manufacture of heavy coal screens. Well located in the borough of Shamokin, Pa., with the best facilities for shipping by rail, and surrounded by a district contributing all the work that a shop of that kind can possibly turn out. The works are now running, but in a very short time possession can be given. Easy terms of payment are offered to suit a purchaser of limited capital.
Offered for sale by
WM. McILVAIN & SONS,
Reading, Pa.

Bolt, Nut and Washer Machinery For Sale.

Six 1¼-in. double-head Bolt Cutters with automatic stop, and powerfully geared, and particularly adapted to cutting Track Bolts or large quantities of Bolts of various sizes.
Four ⅞-in. double-head Bolt Cutters, the same as are used in all large bolt factories.
Two 4-spindle and One 6-spindle Nut Tappers.
Two No. 2 Washer Machines for making all washers to ⅞ in.
One No. 1 Washer Machine for washers up to 2 in. Bolt Size.
Two Bolt Headers with latest and best improvements for all bolts to 1 in. Strongest heads and largest variety of any machine in use.
One No. 1 Nut Machine for 1⅛ in. Nuts, hexagon or square.
Two No. 2 Nut Machines for No. 1 Nuts, and all under.
Two No. 3 Nut Machines for ⅝ in. Nuts, and all smaller; 1000 lbs. of ⅜ in. Nuts made per day.

YORK & SMITH,
Cleveland, Ohio.

For Sale.

Four Large Foot Presses.

Four Tin Manufacturers' Foot Presses, made by Connor, of Brooklyn; three have 17⅛ in. opening in bed and one 7 x 7; all have his patent adjustable bed plates. They are in first-class order and will be sold at very low prices.
A lot of 16 round combination dies for tops and bottoms, large and small, made for them, will be given gratis with the presses, or sold separately for one-third their value.
We make all styles and sizes of Punching and Shearing Presses for metal workers—power, foot or hand,—from $25 to $2000. Also, Upright Power Drill Presses, from $25 to $150.
PEERLESS PUNCH AND SHEAR CO.,
115 W. Liberty St., New York.

For Sale.

Thirty Tons second-hand 25 lb. T R. R. Iron, used but little and good as new; a bargain.
Address D. S. COOK,
Wrightsville, Pa.

For Sale.

One Harris-Corliss Engine, cylinder 28x48, wrought iron shaft 14 inches at the journal; recently rebuilt and warranted in perfect order; fly-wheel 26 feet diameter, and weighs 70,000 lbs. Also one large roll lathe at a great bargain.
POPE IRON AND METAL CO.,
St. Louis, Mo.

For Sale.

SECOND-HAND DROPS AND LIFTERS
BRECHER & PECK,
Lock Box 122, New Haven, Conn.

For Sale.

A well selected stock of Hardware in a thriving county seat in Ohio.
Stock all first-class, and in splendid order.
Stock not large but very complete. This is a rare opportunity. For particulars, address,
"OHIO,"
Office of *The Iron Age*, 83 Reade St., New York.

For Sale.

A Locomotive of standard gauge and in running order; Cylinders 13½ x 22; made at Baldwin Works, Philadelphia.
JOHN H. BRAKELEY,
Bordentown, N. J.

REDUCTION IN PRICE.
JENNINGS' DISCOUNT TABLES.
(2 % to 85 % and all the combinations.)
We find them correct and wonderfully "labor saving."—Sargent & Co., New York.
"Your discount tables are all you claim for them." T. W. Root, with Russell & Erwin Mfg. Co., Toledo, O.

Counting House Edition, postpaid	$1.15
Pocket Edition, Cloth Bound, "	.50
Pocket Edition, Paper Covers, "	.40

Currency may be sent by mail at publishers' risk.
Address, S. H. JENNINGS, Deep River, Conn.

DRILLS.

Two heavy 4-spindle Drills, used but little, well made, for sewing machine work. Will be sold cheap. Also,
1 Light 2-spindle Drill.
1 100 lb. "Dead Stroke" Hammer.
300 "Bartram" Lock-stitch Sewing Machines.
100 "Bartram" single-thread Sewing Machines, suitable for export.
F. A. HULL & CO.,
Makers of Danbury Drill Chuck,
Danbury, Ct.

WANTED—From Jan. 1, 1882, situation as salesman with stamped ware manufacturer, by one who has had 15 years' experience.
Address, TINWARE,
Office of *The Iron Age*, 83 Reade St., New York.

Special Notices.

For Sale.

The Little Schuylkill Rolling Mill,

at Millidale, Schuylkill County, Pa., near Port Clinton, on the line of the Philadelphia and Reading Railroad, consisting of a Merchant Bar Mill in complete running order, with a splendid water power sufficient to run the mill two-thirds of the year. Engines, Boilers, Foundry and Machine Shop, with Lathe for turning rolls, and all other appurtenances necessary to commence operation at once. Together with dwellings, stables and large tract of land, to be sold low if applied for soon. For further particulars address or apply to
J. O. RICHARDSON,
No. 232 Dock street, Philadelphia.

FOR SALE LOW.—ENGINE.

A Vertical High-Pressure Steam Engine, complete. Cylinder, 24 in. by 48 in. Built by A. J. Sweeney & Son. Can be seen in daily use at our nail factory.
LA BELLE IRON WORKS,
Wheeling, West Va.

For Sale.

Two Corliss Condensing Beam Engines,

32 in. x 72 in. cylinders. Address,
THE HARTFORD ENGINEERING CO.,
Hartford, Conn.

For Sale.

Stock of Hardware, Fixtures, and Good Will of the subscribers, in the city of Norwich, Conn.
Only one other hardware store. Population 21,000.
FULLER & PARISH.

For Sale.

Hardware Stock and Trade in Michigan.

Those wishing to buy a complete stock and fine trade, and in a beautiful place to live, will find a rare chance by addressing S.,
Office of *The Iron Age*, 83 Reade St., New York.

For Sale.

One 20-inch Engine, one 100-horse Locomotive Boiler; two large Pulleys, 30-inch face; a 20-inch Rubber Belt, &c. All in good order, and will be sold for less than value to make room for larger. Can be seen running at
AKRON RUBBER WORKS,
Akron, Ohio.

For Sale.

Hardware Stock and Business.

Located in one of the best towns of Northeastern Pennsylvania. Stock clean and well assorted, suited to the requirements of the trade where located. Business of 30 years' standing. For terms and full particulars apply to
JAMES S. KUHN, Towanda, Pa.

For Sale.

Ten Double Acting Power Punching Presses, A1 order. Eight Single Acting Power Punching Presses, A1 order. Most of the double acting presses are the No. 3 Waterbury Press; the single acting, No. 2. One large Bliss & Williams Punching Press. One hundred and twenty-seven Foot Presses in A1 order, most of them square slides. Address, THE GEORGE PLACE MACHINERY AGENCY, 121 Chambers and 103 Reade sts., N. Y.

For Sale.

Stock of hardware, stoves and implements, and store furniture, in one of the best towns in Kansas.
Address HARDWARE,
Box 366, Salina, Kansas.

ELECTRIC LAMP.

For sale, United States Patent No. 245,933, granted for an Electric Lamp, Aug. 23, 1881.
Address "ELECTRIC,"
Office of *The Iron Age*, 220 S. 4th st., Phila., Pa.

BUSINESS CHANCE.

A first-class Retail Hardware Store in the vicinity of New York City for sale on reasonable terms. One who desires to acquire a business can be employed for a month or two to get acquainted with the entire place.
Address E. H.,
Office of *The Iron Age*, 83 Reade St., New York.

For Sale.

Just what every machine shop, foundry, rolling mill, engine room, &c., requires this season of the year is the
Dangler Vapor Illuminating Torch,
a brilliant, economical and convenient light.
Sample torch sent on receipt of $3. See cut in this issue of *Iron Age*. Address
DANGLER VAPOR S. & REFINING CO.,
Cleveland, Ohio.

Wanted to Lease,

A BLOOMARY FORGE,

With four to six fires. Water power preferred. In answering advertisement, give size of buildings, construction of fires and price asked.
Address CHARCOAL BLOOM,
P. O. Box 1046, New York City.

Wanted.

A good Bookkeeper, one who is thoroughly familiar with furnace books and accounts.
Address, with references,
E. O. LACKLAND,
St. Louis, Mo.

Hardware Business for Sale,

In thriving village of 5000 inhabitants in Southern New York. Three lines of railroads to New York. Doing about $50,000 business a year. Trade could easily be increased to $70,000 by putting in stock bar iron, steel, &c. Satisfactory reasons furnished for selling. Please address
"C.,"
Office of *The Iron Age*, 83 Reade St., New York.

Special Notices.

JOB LOT.

ELEY BROTHERS' GENUINE BLUE CARTRIDGE CASES,

Twelve Gauge.

The best paper shell in the market. For sal cheap. Supply limited.
ALFRED FIELD & CO.,
93 Chambers St., N. Y.

Copartnership Dissolution.

NOTICE is hereby given that by the death of the junior partner, Mr. Nathan Anthony, the firm of BRADFORD & ANTHONY is this day dissolved.
The affairs of the firm will be settled by the undersigned, the sole surviving partner.
MARTIN L. BRADFORD.
Boston, June 12, 1881.
All communications in regard to the affairs of the late firm should be addressed to
BRADFORD & ANTHONY, Boston, Mass.

MARTIN L. BRADFORD hereby gives notice that he will continue his business under the name of "BRADFORD & ANTHONY."
The estate of the late Nathan Anthony is to be in no way interested in the future business, whether conducted under the name of Bradford & Anthony or otherwise.
All business communications should be addressed to
BRADFORD & ANTHONY,
374 Washington St., Boston,
Importers, Manufacturers' Agents and Dealers in Cutlery, Fishing Tackle, Skates.
See advertisement on page 11.

HEAVY IRON WORKS WANTED.

An Eastern Manufacturing Company, doing a profitable business in heavy wrought iron structures, the manufacture and sale of which they control for the United States and Canada, wish to establish additional work, located in the West, South, Pacific Coast and Province of Ontario. Must have first-class freight advantages for receiving rolled structural and merchant iron. Address
WM. O. DOUGLAS, Binghamton, N. Y.

Notice.

The undersigned firm would be pleased to accept the representation of first-class firms manufacturing machinery. Address,
J. S. LIZARS & CO.,
Manufacturers of Shilds & Lizars' Feed Water Heater and Purifier, and dealers in New and Second-hand Machinery, 33 Fifth Avenue, cor. Lake street, Chicago, Ill.

To Coal and Iron Manufacturers.

WANTED,

A situation by a practical manager of rolling mills. Can be well endorsed as understanding the coal and iron manufacture thoroughly in detail. Understands calcining of ores, making coke with or without kilns; can handle men and material successfully. Highest testimonials and references from last employers. Address
COAL AND IRON,
Post Office Box 523, Pittsburgh, Pa.

HOW TO

KEEP BOILERS CLEAN,

And Other Valuable Information.

A book sent free to engineers and steam users by
JAMES F. HOTCHKISS,
84 John St., NEW YORK.

NOTICE.

TO THE HARDWARE TRADE,

Retail and Wholesale.

Before buying, send to me for quotations. Will give special figures lower than market rates on a large line of Shelf Hardware and Tinware.

A. W. WHEELER,
141 Lake St., Chicago.

Bissell & Welles,

Wholesale Hardware Auctioneers
83 Chambers and 65 Reade Sts., N. Y.

Sales held weekly for the trade. Consignments solicited. We refer to the leading Manufacturers and Importers.

Wanted.

By an engineer of extensive experience, thorough knowledge, exemplary habits and satisfactory personal and professional credentials, a position as superintendent or manager of an iron or steel rolling mill. A thorough, practical acquaintance with all departments of rolling mill work guaranteed. Address, MANAGER,
Office of *The Iron Age*, 83 Reade St., New York.

Wanted.

$3000 to $5000 Working Capital

(with or without services), to work a valuable Magnetic Iron Ore Mine that will pay 50 per cent. on the investment. Only those with cash and meaning business address, MAGNETIC,
Office of *The Iron Age*, 220 S. 4th St., Phila., Pa.

For Sale.

A Foundry, well located in Philadelphia, with a good run of business. A first-class opportunity for party with a few thousand dollars.
Address "FOUNDRY,"
Office of *The Iron Age*, 220 S. 4th St., Phila., Pa.

For Sale.

Four Double-flue Steam Boilers, 28 feet long, 42 inches in diameter; in first-class condition, with new steam and mud drums and new fire fronts.
For further particulars apply to
SHOENBERGER & CO.,
Pittsburgh, Pa.

To Manufacturers and Others.

FOR SALE,

Combined Shear, Punch, Upsetter and Bender Patents—Reed & Bowen's. Terms reasonable.
C. W. TORREY, 167 West 23d St., New York City.

Sanderson Bros. Steel Co.

Forty shares for sale at a discount.
EDWARD FRITH & SON,
241 Pearl street, New York

Trade Report.

Office of THE IRON AGE,
WEDNESDAY EVENING NOV. 2, 1881.

The past week has been characterized by less activity in commercial circles than for several weeks immediately preceding, it being apparent that the volume of domestic trade is gradually shrinking, which is accounted for by the comparative absence of speculation. Nevertheless, there is reason to believe that the fall trade will figure up a larger total than was anticipated. Prices generally are well maintained, but less buoyancy is observable. There is a slight reaction in breadstuffs and provisions; not enough, however, to give impetus to the export trade, which is deadened by the high cost of all sorts of exportable commodities. The available supplies are controlled almost exclusively by what is called the "bull interest." In dry goods, the jobbing trade is of moderate proportions, the demand being much lessened in comparison with previous reports, but values are steady and manufacturers are receiving larger orders than is usual at this season.

On the Stock Exchange the market was favorably influenced early in the week by the announcement that the Pennsylvania Railroad Company had advanced their rates for passengers and East-bound freights, and at a later date, when corresponding action on the part of the New York Central and Erie made it apparent that the companies were resolved to obtain better remuneration for the heavy business pressing upon them, large amounts of stock changed hands at a higher range of quotations. New York Central and Hudson advanced from 137 @ 141, Lake Shore from 118¾ @ 122⅞ and Michigan Central from 88¾ @ 96—this improvement being mainly caused by the effort to cover very heavy "short" contracts which had grown up in the market. On Monday, information was received of the collapse of the Mechanics' National Bank of Newark, N. J.—reported to be the strongest in the State—brought about by the defalcation of the cashier, now understood to be very near $2,500,000. The event had a depressing effect. To-day in the stock market an excited business in Erie and telegraph shares was the notable feature. The former has shown a free demand and steady prices for some days past, and the additional buying to-day is attributed to an important settlement with the Erie Company of the McHenry (London) claim of $2,000,000, against which the Erie has held $1,100,000 stock in the Cleveland and Columbus road for several years.

The posted rates for prime bankers' sterling are 4.81 @ 4.81½ and 4.85 @ 4.85½, several of the prime drawers having this morning reduced rates half a cent to the pound sterling. The actual rates are 4.80¾ @ 4.80¾ and 4.84½ @ 4.85, with cable transfers, 4.85¼ @ 4.85¾, and prime commercial bills, 4.78½ @ 4.78¾. Commercial bills continue to be scarce, and, on the other hand, the demand for remittances is not large.

The government bond market was strong through the week and very active for the extended 5's, which were in demand by National banks to replace extended 6's on deposit, also for the purpose of increasing circulation.

The money market is rather easy at 5 @ 6 % for call loans, 6 % for time loans, and 6 @ 7 % for prime mercantile paper. The easier condition is due to the November interest disbursements by the Federal Government, amounting to upward of $3,000,000, while New York City disburses $3,146,661 for interest and $2,266,200 in redemption of the principal of the debt. Foreign gold, of which the steamship Wieland to day brought 882,000 francs, and the Vandalia 852,000 marks, or in all about $389,000, is not without its effect.

The exports of domestic products from the port of New York for the week make one of the smallest showings for the year, the amount reaching only $5,910,615. The total since January 1 from this port are $326,251,350, against $346,226,177 last year.

The debt statement for October shows a reduction for the month of $13,321,458, and for the last four months of over $55,000,000. This exceeds the reduction for the corresponding four months of last year by $22,000,000.

The bank return for the week shows a gain of $2,803,525 in reserve, which now stands at $4,710,800 above, against $3,743,575 above at this time last year, and $311,800 below at the corresponding period in 1879.

The importations of specie and bullion at this port during the week ending Oct. 28 were $1,542,197, consisting of $1,522,353 in gold and $19,844 in silver, as against a total of $3,341,517 for the week ending Oct. 30 last year. The importations since the 1st of January and since the 1st of August compare as follows with the movement during the corresponding periods last year:

	Since January 1	
	1881.	1880.
Gold	$49,438,925	$45,556,430
Silver	2,279,120	4,183,523
Total	$51,718,045	$49,739,953
	Since August 1	
	1881.	1880.
Gold	$20,814,666	$43,582,063
Silver	525,191	989,017
Total	$21,339,857	$44,571,080

Government bonds at the close were firm at the following quotations:

	Bid.	Asked.
U. S. 4½'s 1891 registered	112	112⅝
U. S. 4½'s 1891 coupon	113	113⅛
U. S. 4's 1907 registered	116	116⅛
U. S. 4's 1907 coupon	116	116⅛
U. S. Currency 6s 1895	130	—
U. S. Currency 6s 1896	130½	—
U. S. Currency 6s 1897	131½	—
U. S. Currency 6s 1898	132½	—
U. S. Currency 6s 1899	133½	—
Sixes continued	101	102¼
Fives continued	101⅞	102

The following is an analysis of the bank totals of this week compared with that of last week:

	Oct. 22.	Oct. 29.	Comparison.
Loans	$311,310,500	$309,254,500	Dec. $2,056,000
Specie	58,359,400	61,068,100	Inc. 2,708,700
Legal t'd'rs	15,208,700	15,652,400	Inc. 443,700
Tot. reserve	73,568,100	76,720,500	Inc. 3,152,400
Deposits	286,643,300	288,038,800	Inc. 1,395,500
Reserve required	71,660,825	72,009,700	Inc. 348,875
Surplus	1,907,275	4,710,800	Inc. 2,803,525
Circulation	19,919,000	19,948,000	Inc. 29,000

MINING STOCKS.

The following were the closing quotations for mining stocks:

	Bid.	Asked.
Amie	25	26
Alice	....	5.75
Alta Mont	....	1.80
Bell Isle	22	....
Bodie	6.75	....
Bulwer	....	2.50
Bull Dom	60	75
Boulder	10	15
Big Pittsburgh	85	90
Bradshaw	....	80
Calaveras	10	12
California	75	....
Consolidated Imperial	19	....
Consolidated Virginia	2.33	2.35
Chrysolite	6.25	6.37½
Cent. Ariz	1.50	1.80
Cherokee	1.20	1.25
Dunderberg	65	....
Findley	....	27
Fa. DeSmet	8.75	9.12½
Goodshaw	49	....
Great Eastern	11	13
Green Mountain	4.00	....
Horn Silver	16.37½	16.87½
Hibernia	30	31
Independence	....	25
Iron Silver	2.00	2.05
Lacrosse	21	....
Leadville	1.40	1.50
Little Pitts	2.50	2.60
L. Chief	1.00	1.05
Mariposa	3.00	3.30
Mar. Pref	3.00	5.00
Moose	96	....
Miner Boy	47	50
Navajo	31	....
Nor. Belle	12.00	....
Ori. and Mil	69	....
Robinson	13.00	....
Red Eleph	....	19
S. Nevada	15.50	....
Silver Cliff	3.15	3.20
Sutro	1.30	1.40
Sprg Val	3.00	3.75
Stormont	2.10	2.15
South Pacific	....	9.60
South Hite, new	....	40
St. L No. 4	....	80
St. L 2 and 3	3.40	3.45
Tuscarora	3	4
Union Con	....	16.00
Unadilla	7	8

GENERAL HARDWARE.

Business continues active and values steady, with an upward tendency in many lines of goods. The demand for foreign Hardware is satisfactory, considering the lateness of the season, and prices are firm and unchanged.

The Rule Manufacturers on the 1st instant advanced the price of Boxwood Rules to discount 66⅔ and 10 per cent., and Ivory and Miscellaneous Rules to discount 55 and 10 per cent.

Chapin's Plumbs and Levels are now quoted discount 65 and 10 and 10 per cent, formerly 65 and 10 per cent.

The Manufacturers of Augers and Bits and Chisels and Drawing Knives held their usual monthly meetings in this city to-day, at which existing prices and terms were reaffirmed.

The demand for Nails is very active and the tone of the market strong. We continue to quote 10d. to 60d., $3 30 @ $3.40, net, according to quantity. The inquiry for Nails for export is active, and we hear of orders pending that it is expected will result in considerable business. A curious feature of this branch of the business is found in the fact that a large proportion of the Nails sold in this market at present for foreign account are Canadian goods sold in bond. These Nails are quoted in bond here at $2.95 rates, or 35 cents per keg below the combination rate for domestic.

S. H. & E. Y. Moore, Chicago, Ill., quote their Anti-Friction Door Hangers, &c., as follows:

	Dis. per cent.
Railroad Hangers	50
Baggage Car Door Hangers	25
"Climax" Barn Door Hangers	50
Sash Pulleys	50

We have received the following circulars:

Office of ROY & CO., WEST TROY, N. Y.,
November 1, 1881.

GENTLEMEN.—Withdrawing all former circulars, below find our present prices for Wrought Butts and Strap and T Hinges:

Wrought Butts, Narrows, Table, Backflaps	45, 10&10
Wrought Butts, Light Narrows, Light Inside Blind, &c.	45, 10&10
Wrought Butts, Reversibles, Light Joints, &c.	50, 10&10
Strap and T Hinges	45, 10&10

Yours truly, ROY & COMPANY.

No. 70 BROADWAY, BROOKLYN, E. D.,
November 1, 1881.

DEAR SIR: I have opened a store at No. 70 Broadway, where, in addition to articles of my own manufacture, I shall keep a full line of Machinists' and Manufacturers' Supplies, such as Machine Bolts, Lag Screws, Wood Screws, Iron and Brass Machine Screws, Iron Case-hardened Set Screws, Hexagon Head and Square Head Cap Screws, Stove Bolts and Sink Bolts, Nuts and Washers, Machinists', Blacksmiths' and Gas Fitters' Taps, Stocks and Dies, Twist Drills, Files and Wrenches, and also a line of Sheet Brass, Brass and Iron Wire, and Brass, Iron and Steel Rods. All orders promptly attended to. Yours truly,

JOHN FELLOWS,
Successor to the Lyon & Fellows Mfg. Co.

Robert B. Hugunin, Hartford, Conn., inventor and manufacturer of Patent Screw Window Balances, cautions the trade, in an advertisement which appears on page 28, against an imitation of his invention, in the construction of which his patents are infringed.

The Wilson Manufacturing Co., New London, Conn., have issued, under date of the 1st instant, the following discount sheet, to apply to their 1881 catalogue and price list. They invite special attention to their Car Box Jack Screw, which they claim is the most perfect Screw in the market. Two sizes of this Jack Screw are made, viz: 2 inch Screw, 8 inch barrel, at $6.00, and 2¼ inch screw, 7 inch barrel, at $7.50 each, subject to discount 25 per cent.

Page in 1881 Catalogue.		Discount Per Cent.
1 to 9, Coffee Mills, change list		45
	Box Mills. Iron Hopper.	
Nos.	202 203 204 3 4 2	
	$9.50 9.00 8.50 6.50 6.00 5.50	
Side Mills, No.	$5.50.	
10 to 11, Solid Box Vises, change list		35
Nos	25 30 35 40	
	$11.00 $3.50 $8.00 $9.00	
11, Vise Boxes and Screws, change list		15
Nos	10 15 16 17	
	$3.00 $6.00 $6.50 $8.00	
12, Pall Bench Vises, change list, No. 00, $2.50		45
13, Coachmakers' Vises		40
13, Coopers' Vises		15
14, Cutlers' Vises		35
14, Cotton Samplers		35
15, Coin Scales		35
15, Tobacco Cutters		35
15, Gridirons		45
16, Geared Braces		15
17, Drill Stocks and Bows		15
17, Breast Drills		20
18, Bench Screws, Wood Handle		30
18, Bench Screws, Iron Handle		40
19, Clamp Heads		30
20, Lathes		20
21, Lathe Wheels		20
21, Lathe, Pulleys, Hangers and Shaft		20
22, Hot House Pulleys		40
23, Sliding Door Sheaves		30
23, Sliding Door Rail		60
23, Shutter Sheaves		20
24, Casters		35
24, Sash Rollers		20
25, Side Pulleys		40
25, Upright Pulleys		30
26, Frame Pulleys		40
27 to 30, Axle Pulleys		40
31, Braces		50
31, Bit Holders		net
31, Cooper's Croze Tools		15
32, Shutter Screws		30
32, Stubbs and Plates		30
33, Shutter Lifts		30
33, Box Chisels		40
34, Jack Screws, Bell Bottom		25
35, Jack Screws, Wrought Iron Barrel		25
36, Jack Screws, Straight Barrel		35
37, Jack Screws, Locomotive		25
37, Car-Box Jack Screws; 2 x 8 inch, $6 each; 2¼ x 7 inch, $7.50 each		25
37, Pinion and Timber Jacks		net
38, Mill Screws		30
38, Timber Screws		15
38, Piano Stool Screws		30
39, Door Clamps		35
39, Ratchets and Pawls		35
39, Carpet Stretchers		45
40, Well Wheels, Anti-friction		20
41, Well Wheels, Plain		45
41, Wheels		20
42, Riggers' Screws		35
43, Ship Carpenters' Clamps		20
44, Gin Wheels		20
45, Thimbles		30
46, Gaff Topsail Hooks		20
47, Connecting Shackles, Thompson's Patent		15
47, Burrs or Washers		net
48, Rings		25
49, Mast Hoops		25
50, Sister Hooks		25
50, Small-eyed Block Hooks		25
51, Hooks and Thimbles		35
51, Match Hooks and Thimbles		25
52, Anchors		net
53, Grappling Irons		15
54, Ring Bolts		50
55, Screw Ring Bolts		50
56, Screw Eye Bolts		50
57, Anchor Shackles		20
58, Chain Shackles		20
58, Boat Cleats		25
58, Boat or Awning Cleats		25
59, Chocks		20
59, Cleats		20
60, Water Deck Irons		10
61, Chain Pipes		10
Inch	2½ 3 3½ 4	
Each	$2.75 1.00 1.50 2.00	
62, Socket Row Locks, Galvanized Iron		45
62, Socket Row Locks, Brass		25
62, Whale Boat Row Locks		20
63, Side Plate Row Locks		30
63, Thole Pin Row Locks		15
64, Rudder Braces, Screw Gudgeon		45
65, Rudder Braces (with strap), change list		10
No.	2 3 4 5 6 7 8	
	$6.00 8.50 12.00 18.00 26.00 34.00 40.00	
66, Rudder Gudgeons		45
66, Boom Foot Stops		15
66, Boat Spikes		net
67, Boat Hooks		20
68, Marline Spikes		35
68, Belaying Pins		25
68, Ship Scrapers		30
69, Caulking Mallets		net
69, Hawsing Beetles		20
69, Hawsing Irons		25
69, Sounding Leads		20
70, Fishing Swivels		15
71, Tackle Blocks, Malleable Iron		40
72, Tackle Blocks, Gray Iron		45
73, Tackle Blocks, Swivel Hook		40
73, Tackle Blocks, Brass		15
74, Bale Hooks		15
74, Box Hooks		15
75, Can Hooks		20
75, Flour Barrel Hooks		15
76, Hogshead Hooks		net
76, Hawser Pipes		net
77, Galvanized Hasps		20
78, 79, Galvanized Hinges		20
80, 81, Brass Hinges		20
82, Door Bolts		25
82, Rudder Yokes		15
83, Calking Irons, Steel Points		20
84, " " Cast Steel		20
85, Steering Sheaves		net
85, Mast Hinges		net
85, Rollers for Chocks		net
85, Press Screws for Whaleman		net
85, Row Locks		20
86, Cast Iron Washers		net
86, Sash Weights		net
86, 87, Bushings, Flange		net
88, Ankle and Wrist Shackles		20
88, Cold Chisels		60
88, Pew Door Butts		25
89, Metal Sheaves		net
90, Lignumvitæ Sheaves		net
91, Blockmakers' Rivets		25
92, Block Pins		25
92, Mast Hoop Forelocks		25
92, Pump Chambers		25
93, Clothes-line Pulleys		40
93, Quarter Blocks		20
93, Derrick "		20
93, Wharf "		20
94, Iron-strapped Blocks		50
95, Rope-strapped "		50
95, Snatch Blocks		50
96, Cotton Hooks		50
97, Box Hooks		30
97, Hay "		30
98, 99, Burglar and Tramp Stoppers, change list, No. 5, 50c		40
102-107, Mowing Machines and Extras		net

We have received from Dodd, Dudley & Lipscomb, Nashville, Tenn., a copy of their illustrated catalogue and descriptive price list of Hardware and Cutlery. The book is a substantial cloth-bound volume, containing 328 pages, in which they illustrate a very comprehensive assortment of Shelf and Heavy Hardware, Mechanics' Tools, Wagon Makers' Supplies, Farming Tools and Machinery, Guns, Sporting Goods, &c. Introducing the book, they say, "We have endeavored to compile a catalogue containing a line of Hardware suitable to the Southern trade. We have no doubt we have fallen short of perfection, but we hope the faults of this book will be overlooked when it is considered that it is our first attempt, and perhaps the first time an effort of this kind has been made by a General Hardware dealer in the South." The catalogue, in our opinion, needs no accompanying apology; it is well arranged, contains a great number of valuable standard lists, and the illustrations, paper, printing and binding are excellent.

Markt & Co., 139 Centre street, have issued a catalogue and price list of American Agricultural Implements, Tools, &c., suited to the requirements of the export trade. Illustrations of a large assortment of Steel Forks, Shovels, Spades and kindred goods are shown, and the descriptive text is very full. A feature of this catalogue of great value is the measurements showing the number of cubic feet cases of the different articles contain; also the charge for cases, thus enabling a distant buyer to arrive as nearly as possible at the exact cost of the goods. In addition to Agricultural Implements, they show a good line of Wrenches, Axes and Hatchets, Clothes Wringers, Ice Cream Freezers, Pumps, &c.

The following circular explains itself:

NEW HAVEN, CONN., November 1, 1881.

It has come to my knowledge that a certain manufacturing company, located at Cincinnati, Ohio, are manufacturing, selling and representing to the trade their right to make and sell a cylindrical door bolt, the mechanism being a *fac simile* of one of my production, known to the trade as "Ives' Patent Door Bolts," protected by letters patent under date of May 8th, 1877; April 9th, 1878; December 10th, 1879, and a reissue, October 18th, 1881. My attorney informs me that the door bolt above referred to, manufactured in Cincinnati, Ohio, unquestionably infringes upon reissued letters patent No. 9901, dated October 18, 1881, held and owned by me. Third and fourth claims of said letters patent are as follows:

Third Claim.—The combination of the bolt C, provided with the lug *c*, pitman E, operating as a pitman and spring, and crank D to hold the bolt substantially as set forth.

Fourth Claim.—In a cylindrical door bolt, the pitman E, arranged and adapted to operate as a pitman and spring, substantially as set forth.

In justice to myself I shall protect my rights against both manufacturer and dealers. And to the trade that may sell door bolts infringing upon my patents, I respectfully give notice that due respect of my rights will be duly enforced.

HOBART B. IVES.

BRITISH IRON MARKET.

[*Special Report by Cable to The Iron Age.*]

LONDON, Nov. 2, 1881.

Scotch Pig.—Prices continue to fluctuate with the downward tendency, the strongest quotations this week showing a decline of 1/ on Coltness and 6d. on the remaining brands quoted. The following are to-day's prices:

Gartsherrie, alongside, Glasgow			59/
Coltness	"	"	59. 6
Glengarnock	"	Ardrossan	52/6
Eglinton	"	"	50/

Lighterage from Ardrossan to Glasgow is 2/ @ 2/6 per ton.

Bessemer Pig.—The upward tendency of prices received a check during the week, and values fell a little, but have since recovered and are now steady. We quote lots of equal portions of Nos. 1, 2 and 3 at 61/.

Manufactured Iron.—The market is active and transactions large, with prices firm. We quote Best Staffordshire Bars £7. 10/ @ £8.

Steel Rails.—A fairly active business has been done under a steady demand, and prices rule firm. Quotations for ordinary sections remain at £6. 5/ @ £6. 10/.

Iron Rails.—The market is quiet, with moderate business and steady prices. We quote Welsh unchanged, £5. 5/ @ £5. 10/.

Old Rails.—Sales are light and offerings moderate; prices, however, are firm. Old Tees, c. i. f. United States ports, are quoted £4. 10/.

Scrap.—Prices are steady and business fair. The offerings are moderate. We quote Wrought, c. i. f. United States ports, £3. 15/.

Freights.—Steam freights from Glasgow to New York, 10/.

A later cable dispatch to an importing house in this city, quotes steam freights from Glasgow to New York advanced to-day to 15/.—[EDITOR.

IRON.

American Pig.—While we have not heard of any large transactions in raw Irons during the week, the tone of the market has gained rather than lost strength, and the tendency of values seems to be upward. We continue to quote: Foundry No. 1, $25 @ $26; Foundry No. 2 X, $23; Gray Forge, $21 @ $21.50.

Scotch Pig.—Sales are reported of 700 tons Gartsherrie and Eglinton at $25 @ $25.50 for the former, and $23 for the latter; also 600 tons Glengarnock in lots at $24.75 @ $25. The tone of the market is strong, and the demand sufficient to absorb all of the Iron arriving. We quote: Eglinton, $23.50 @ $24; Carnbroe, $24.75; Coltness, $26.50; Glengarnock, $25; Gartsherrie, $25 @ $25.50; Summerlee, $26.

A fair demand for Middlesboro' Iron is reported, and we hear of a sale made to-day of 500 tons No. 3 at $21.

Rails.—We have not heard of any new business either in Steel or Iron Rails since our last writing, and quote, nominally: Steel Rails, 1882 delivery, $60 at mill; and Iron, $48 @ $50.

Old Rails.—The only transaction that has come to our notice during the week is a sale of 500 tons Ts for shipment to Philadelphia at $29. We quote: Ts, $28.50 @ $29; and D. H., $31.50 @ $32.

Scrap.—Sales are reported of 200 tons No. 1 Wrought, to arrive, at $29.50, and 500 tons, for shipment, on private terms. Spot lots are scarce, and prime selected, from yard, is held at about $32.50.

METALS.

Copper.—There is a decidedly better feeling in the Copper market, 100,000 lb even being taken on speculation, and we quote the range for Lake Superior at the close 18⅛¢ @ 18¼¢, there being hardly any in the market outside of what is held by producers. The time is now fast approaching when manufacturers, including the larger ones, will have to replenish supplies. For the moment, one borrows Copper from another, so as to postpone this reappearance in the market as much as possible, but these expedients and shifts will not last long. The mining companies meanwhile quietly await the action of consumers; their position is one of great ease and strength; they are, therefore, firm at 18¼¢. Baltimore is nominally worth as much as Lake Copper. There is no change in the London market; Best Selected is cabled £70, and Chili Bars, £63. "London, October 15.—Throughout the whole of the past week this market has remained very steady. There has been scarcely any alteration from day to day in the official quotations, and a fair amount of business has been carried through. The principal adverse feature which for so long past has affected this market—the very heavy stock—is gradually, but at the same time effectually being done away with, so that we have seen that upon the publication of the last few statistics a sensible reduction has been made in the visible stocks." Manufactures are quoted as under: Fit and Hot-rolled Flat Bottoms, 29¢ per pound; Cold-rolled Flat Bottoms and Fit Bottoms, with flange cut, 30¢; Braziers, 28¢ @ 34¢, as to size and weight; Circles, 31¢ @ 34¢; Sheets, 28¢ @ 31¢; Sheathing, 26¢, and Bolt Copper, 28¢.

Tin.—Our market has been a trifle firmer since last week, and about 250 tons Straits and Australian have changed hands at 20¾¢ @ 21¢. Foreign markets remain unchanged. London fluctuates between £97. 10/ and £98, spot cash. Singapore quotes the parity of 22¾¢ here. Shipments from Singapore to the United States in October have been 800 tons. We quote toward the close, large lines, Straits, 21¼¢ @ 21⅜¢; Australian, 21¼¢, and Billiton 21¼¢. Mr. Charles Nordhaus', (New York) monthly statement shows that the stock of Tin in the United States was on—

	Tons.	Tons.
Oct. 1	1,720	
Oct. arrivals	1,480	
Total supply	3,100	
Less Oct. consumption	700	
Leaving Nov. 1, stock on hand		2,400
AMOUNT AFLOAT:		
From the Straits	1,780	
From Australia	600	
From Billiton	220	2,600
Nov. 1, total visible supply		5,000

We at the same time receive Messrs. Gilfillan, Wood & Co.'s (Singapore) statistics of Tin shipments from the Straits settlements to the United States during the first eight months, and find them to have been:

	Piculs.	Tons.		Piculs.	Tons.
1881	53,712	3,206	1878	41,473	2,475
1880	94,705	5,652	1877	34,811	2,080
1879	63,814	3,812	1876	26,598	1,513

The 3206 tons shipped during the eight months are a very moderate supply; since then shipments from there have been on the increase. "London, Oct. 15.—A very large business has again to be recorded in this metal, and transactions have continued to be carried through at variable rates, but at the same time prices are higher, the advanced rates in many instances being readily paid. The tone of the market unquestionably keeps good; and as there is little or no chance of forced sales being effected, for according to the last issued statistics the stock is light, and besides this it is distributed now more than of late, so that if any one seller shows much disposition to realize, there are plenty of buyers who are only too willing to relieve him of his stock." *Tin Plates.*—Since our last week's report Tin Plates have been a little lower, Coke Tin being obtainable in large lines at $5.12½. While holders are quite willing to sell at this figure, the trade take the lots offered as readily, but the market is, nevertheless, dull. We quote toward the close, large lots, ordinary brands, per box: Charcoal Bright, $5.87½ @ $6.25; ditto Ternes, $5.20 @ $5.37½; Coke Tin, $5.12½; and ditto Ternes, $5. We receive per cable from Liverpool the quotation of 15/6 @ 16/ for Coke Tin, and of 18/6 @ 19/ for Charcoal.

Lead.—Sales for the week sum up in a small way about 200 tons, the business being a hand to-mouth one. Some 700 tons Richmond have arrived from California, rather anxiously expected. This meets the more urgent necessities of consumers for the time being, and is pretty well distributed among them. Above sales were made at about 5¢; 4.75¢ is all that is bid at the close. Although consumption still goes on satisfactorily, it should not be overlooked that we approach the dull season. At the same time there is as yet no accumulation of stock anywhere. St. Louis is quiet at $4.80 for Common, and 5¢ Corroding, to which a freight of 29¢ per 100 lb to New York has to be added. Europe is also quiet. It costs $5.40 to lay Lead down here from there. "London, Oct. 15.—This market is steady, without change in price." We quote manufactures as follows: Sheet Lead, 8¢ per lb; Lead Pipe, 7½¢; Tin-lined ditto, 15¢, and Block Tin ditto, 35¢, being an advance of ½¢ on the two first named; all less the usual discount.

Spelter and Zinc.—Common Domestic Spelter has been active at 5¼¢, while Silo

sian may, nominally, be quoted 5⅞¢. There is none of the latter here at present, nor any on the way that we know of. As the metal is situated, there is every prospect that ruling rates will be upheld for some time to come without much chance of the price materially advancing in the immediate future. Europe gradually improves. Godulla sold at Breslau on October 11 at 15.80 marks per 50 kilos. "London, October 15.—Spelter steady at £16. 12/6 @ £16. 15/ for ordinaries." Sheet Zinc continues slightly upward at New York; it may now be quoted 7½¢ @ 7⅝¢.

Antimony.—A fair consumptive demand exists as heretofore, causing Cookson's brand to bring 14½¢, while Hallett's is worth about 13¼¢ @ 13½¢.

COAL.

The Coal trade is active. On all sides preparations are making for the close of navigation, and orders consequently are being filled with all the dispatch that circumstances permit. The lack of cars for transportation is the general complaint, both in the Anthracite and Bituminous branches of the traffic, the delay from this cause in some cases being serious. Only four weeks of navigation remain. Two weeks hence it will close in Canada. On the Erie Canal shipments will practically close about the 15th inst., and the Hudson, say about December 15th or 20th. These prospects will make business lively for a few weeks. In prices there is said to be no cutting below circular rates, all the companies having orders beyond the supplies immediately in hand. Eastern buyers who have held off in expectation of a decline are now pressing their orders. Coal operators report an abundant supply of water in the mining regions, affording a welcome relief. Quotations remain unchanged: Lehigh, $5 @ $5.25 for Lump; Grate, Egg and Stove, $4.25 @ $4.45; Chestnut, $4; Wyoming, $3.90 @ $4.20 for the usual sizes.

In Bituminous Coals the demand is said to be peremptory, without special regard to price. Orders will not be received in New York for immediate delivery. The nominal prices are stated thus: At Baltimore, $3.60; Georgetown, $3.35; at New York, $5. The trouble is a deficiency of cars for transportation. Freights are unchanged, and there are vessels enough, but much delay in loading.

The Pottsville *Miners' Journal* says: "The demand continues very active for Egg, Stove, Small Stove and Chestnut, and Broken is in fair request. Orders are being freely booked for next month's delivery, and the indications all point to a continuance of good business until the cold weather puts an embargo on business." The Committee of the Lehigh and Schuylkill Coal Exchanges on Friday agreed to recommend no change in line, city and harbor prices for the month of November. "It's the old rule of let well enough alone," said a leading member. "The trade is in too good a condition to risk the spoiling of it by an advance."

The Philadelphia *Ledger* says: "Admitting that the next year's demand for coal may be no greater than the usual average annual increase, the production going to new territory, and especially to the West, will serve to so widen the field of consumers that prices are more likely to advance than otherwise for years to come. The iron manufacture demand for coal holds up well, and, in the opinion of those well-informed, will even exceed the demand for the year 1881."

The total tonnage of Anthracite Coal from all the regions for the week ending October 22, as reported by the several carrying companies, amounted to 633,710 tons, against 659,768 tons in the corresponding week last year, a decrease of 26,058 tons. The total amount of Anthracite mined for the year is 22,485,321 tons, against 18,519,691 tons for the same period last year. The total amount of Bituminous mined for the year is 4,018,540 tons, against 3,499,046 tons for the corresponding period last year.

FOREIGN TRADE MOVEMENTS.

The following is a summary of the foreign trade movements for the past week:

IMPORTS

For the week ended October 29:

	1879.	1880.	1881.
Total	$7,798,317	$7,049,886	$7,580,223
Prev. reported	260,719,283	398,458,321	357,800,585
Since Jan. 1	$268,517,600	$405,508,287	$365,380,808

Included in the imports for the week ended October 28, were articles valued as follows:

	Quantity.	Value.
Anvils	202	$1,353
Brass goods	25	2,944
Bronzes	68	14,144
Chains and anchors	11	832
Clocks	53	7,177
Copper	.	8
Cutlery	108	37,275
Pins	1	126
Guns	138	18,367
Hardware	12	2,375
Iron, pig, tons	7,347	150,641
Iron, sheet, tons	35	2,817
Railroad bars	966	5,994
Iron ore, tons	4,859	26,787
Iron, other, tons	1,116	36,902
Lead, pigs	1,456	6,894
Machinery	157	12,746
Metal goods	228	16,366
Needles	80	9,681
Old metal	..	8,989
Platina	3	7,379
Plated ware	5	1,017
Percussion caps	10	1,673
Saddlery	9	804
Steel	36,091	188,379
Spelter	875,625	10,061
Silverware	12	2,068
Tin, boxes	21,244	105,618
Tin, 6,806 slabs, 734,493 lbs	....	161,534
Wire	14	2,098
Zinc	41,785	1,819

The following are the imports of leading articles, compared with previous dates:

	For the week.	43 weeks of 1881.	Same time 1880.
Cutlery, pkgs	108	5,805	7,358
Hardware, pkgs	12	806	1,022
Iron, R. R., bars	966	323,700	514,488
Lead, pigs	1,456	30,228	42,507
Steel, pkgs	36,091	914,879	327,333
Tin, boxes	21,244	1,331,753	1,496,546
Tin slabs, lbs	734,493	14,646,531	23,334,098

EXPORTS, EXCLUSIVE OF SPECIE.

For the week ended November 1:

	1879.	1880.	1881.
Total	$7,910,906	$10,321,211	$5,910,615
Prev. reported	278,794,659	335,914,967	311,570,742
Since Jan. 1	$286,705,565	$346,236,178	$317,481,357

EXPORTS OF SPECIE.

For the week ended October 29:

Total	$176,618
Previously reported	9,154,794
Total since January 1, 1881	$9,331,412
Same time in 1880	6,702,284
Same time in 1879	13,086,554
Same time in 1878	11,131,930
Same time in 1877	24,053,763
Same time in 1876	41,681,754
Same time in 1875	67,635,924
Same time in 1874	44,363,197
Same time in 1873	44,035,543
Same time in 1872	63,449,494

EXPORTS

of Hardware, Iron, Machinery, Metals, &c., from the Port of New York, for the Week ending Nov. 1, 1881:

Dutch West Indies.

	Quan.	Val.
Ptlm., gals	3,086	$351
Mf. iron, pkgs	18	174
Cutlery, cs	2	97
Scales	1	71
Hdw., cs	15	213
Nails, kegs	50	127
Sew. ma., cs.	5	98
Clocks, cs	3	53
I. r. goods, cs.	1	76

Dutch East Indies.

Ptlm, gals	625,390	$75,373

Antwerp.

Hdw., pkgs	46	$929
Tel., cs	4	475
Ptlm., gals	361,000	28,430
Mf. iron, pkgs	20	388
Ag imp., pkgs	1	63
Skates, cs	1	55

Rotterdam.

Clocks, bxs	24	$488
Hdw., cs	2	18
Mf. iron, pkgs	1	30

Danish West Indies.

Nails, kegs	53	$228
Ptlm., gals	2,050	243
Hdw., pkgs	6	86
Mf. iron, pkgs	14	200
Ag. imp., pkgs	3	39
Iron bars	489	900
Copper, sacks	2	54
Boiler	1	500

Hamburg.

Mach'y, cs	31	$12,422
Ag. imp, pkgs	5	314
Sew. ma., cs	1,288	27,307
I. r. g'ds, b'ls.	4	550
Valves, bxs	3	110
Mf. iron, pkgs	6	252
Hdw., cs	120	3,186
Brass, cs	149	14,250
Clocks, bxs	18	608
Blowers	2	50

Bremen.

Ptlm., gals	718,331	$3,135
Hdw., cs	150	3,157
Mfd. iron, pkgs	174	2,950
Pig. press, bxs	21	369
Mach'y, cs	2	120
Ag. imp., pkgs	3	130

Amsterdam.

Hdw., cs	3	$165
Clocks, cs	3	112
Pumps, pkgs.	9	378

Glasgow.

Cartridges, cs.	200	$3,400
Hdw., cs	22	200
Metal, cs	5	200
Mf. iron, pkgs	2	246
Pumps, pkgs.	2	130

Havre.

I. r. goods, cs	6	$1,190
Ag. imp., pkgs	24	929
Sew. ma, cs	130	2,695
Chains, cs	1	250
Naph., gls	244,289	26,871
Pumps, pkgs.	17	1,150
Mach'y, cs	15	3,004

Liverpool.

Metal gds., cs.	1	$200
Mach'y, pkgs.	6	1,963
Ag. imp., pgs.	38	1,315
Mf. iron, pkgs	2	275
Rifles, cs	5	850
Tubing, cs	1	115
I. r. g'ds, b'ls.	29	2,810
Naph., gals	121,445	11,500
Clocks, pkgs.	101	3,910
Hdw., cs	67	3,463
Elec. ap., cs	3	600

London.

R. R. cars	2	$1,900
Mach'y, pkgs.	49	10,100
Hdw., pkgs	523	10,276
Cartridges, cs	1	50
Elec ap., pgs.	1	500
Tubing, cs	1	701
Brass gds, cs.	2	200
Sew. ma., cs	338	18,360
Clocks, pkgs	289	5,928
Ptlm., gals	1,124,526	98,042
Mf. iron, pkgs	27	1,072
Arms, cs	2	484
Shears, cs	2	35
I. r. goods, cs.	1	75

Hull.

Hdw., cs	59	$1,083
Mf. iron, pkgs	6	91
Sew. ma., pgs	21	275
Mach'y, cs	9	490
Ag. imp., pkgs	10	847
Clocks, bxs	84	1,444

Newcastle.

Ptlm., gals	133,831	$10,708

British West Indies.

Ptlm., gals	5,675	$633
Nails, kegs	62	244
Hdw., pkgs	20	339
Mf. iron, pkgs	20	243
Pumps, pkgs.	2	34
Mach'y, pkgs.	2	283

Blaye.

Naph., gals	278,609	$27165

Malaga.

Ptlm., gals	153,012	$16,531

Oporto.

Mf. iron, pkgs	9	$225
Clocks, bxs	22	407

Aarhuus.

Ptlm., gals	152,400	$12,950

Gibraltar.

Ptlm., gals	132,000	$15,180

Cuba.

Mfd. iron, pkgs	101	$1,541
Hdw., pkgs	62	1,251
Pumps, pkgs.	7	250
Scales, pkgs	62	440
Mach'y, pkgs.	814	6,817
Ag. imp., pkgs	44	1,180
Nails, kegs	480	1,417
Wa pipes, pcs	160	191
Sew. ma., cs	163	805
Spikes, kgs	6	26
Cutlery, cs	2	98
Ptlm, gals	198,086	20,215
I. r. g'ds, b'ls.	3	321

Marseilles.

Ptlm., gals	100 009	$11,600
Iron drums	113	1,500

Aberdovey (Wales.)

Ptlm., gals	83,500	$6,600

Dublin.

	Quan	Val.
Ptlm., gals	131,950	$10,556

Hayti.

Nails, bxs	54	$109
Hdw., cs	9	239
Nails, kegs	88	320
Mf. iron, pkgs	8	38
Brass g'ds, cs.	1	110
Ptlm., gals	9,375	749

British North American Colonies.

Sew. ma., cs	8	$160
Ptlm., gals	1,750	265
Hdw., cs	35	1,105
Mf. iron, pkgs	26	190
I. r. goods, cs.	2	150

China.

I. r. goods, cs.	2	$104
Cartridges, cs.	1	30
Hdw., cs	18	512
Mf. iron, pkgs	6	110
Ptlm., gals	440,000	49,508
Rifles, cs	2	129
Iron safes	2	250

Venezuela.

Hdw., cs	100	$1,361
Ptlm., gals	10,700	1,301
Mach'y, cs	3	129
Sew. ma., cs	20	283
Tacks, bxs	32	255
Mf. iron, pkgs	8	170
Ag. imp., pge	3	60
Cutlery, cs	1	74
I. r. goods, cs.	1	60

Central America.

Ptlm., gals	1,250	$251
Hdw., cs	10	248
Mf. iron, pkgs.	117	1,160
Letter bxs	12	67

Brazil.

Hdw., cs	34	$85
Ptlm., gals	65,000	7,585
Clocks, pkgs	32	707
Ag. imp., pkgs	4	150
Nails, kegs	32	116
Clocks, bxs	2	27
Sew. ma., cs	1	43

Canada.

Pig iron, tons	200	$4,330
Guns, cs	12	714

British East Indies.

Ptlm., gals	659,840	$77,903

New Zealand.

Sew. ma., cs	38	$640
Ptlm., gals	45,895	6,817
Mf. iron, pgs	814	8,352
Pumps, pkgs.	8	200
Hdw., pgs	243	4,549
Ag. imp., pkgs	11	501
Clocks, pgs	16	348
Nails, pgs	53	1,040
Nails, kegs	75	300
Mach'y, cs	4	150

British Australia.

Hdw., cs	872	16,935
Ag. imp., pkgs	18	717
Nails, kegs	40	208
I. r. goods, cs.	2	95
Mach'y, pkgs.	81	3,971
Clocks, bxs	249	4,351
Meters, cs	4	100
Tacks, cs	3	137
Guns, cs	5	225
Nails, cs	35	782
Ptlm., gals	19,200	3,610
Pumps, pkgs.	1	40
Wire g'ds, pgs	10	188
Sew. ma., cs	1	50

Chili.

Ptlm., gals	50,000	$5,700
Hdw., pgs	338	6,530
Mach'y, pkgs.	1	107
Mf. iron, pgs.	108	955
Clocks, pgs	13	710
R. R. cars	50	38,750
Ag. imp., pkgs	176	2,666
Tacks, cs	71	534
Nails, kegs	336	1,286
Zinc, bbls	80	980
Sew. ma., cs	22	732
Arms, cs	1	130

IMPORTS

Of Hardware, Iron, Steel and Metals into the Port of New York, for the Week ending Nov. 1, 1881:

Hardware.

Alexandre F. & Sons, Cases, 2
Boker Hermann & Co. Hdw., cutlery and guns, pkgs., 45
Brodsky J. Rifles, cs., 1
Degrauw, Aymar & Co. Mdse., pkgs., 3
Duval H. R. Case, 1
Field Alfred & Co. Cases, 19
Hartley, Graham & Co. Pkgs., 4
Hartmann, Le Doux & Maicker. Mach'y, cs., 1
Hipolito Billi, Cartridges, bxs., 22
Hopkins E. T. Case, 1
Herman H. Saws (5), cs., 1
Lazarus A. S. Nails, kegs, 28
Marcus A. F. & Co. Hinges, cs., 2
Mislard A. Reaping mach., 1
Moore J. B. & Co. Guns, cs., 4
The Clark Thread Co. Mach'y, cs., 33
Ward Asline, Cases, 6
Weibusch, Hilger & Co. Cutl'y, &c., pkgs., 13

Iron.

Baring, Bros. & Co. Rails, 1020 Old rails, tons, 45
Bond, Parsons & Co. Pig, tons, 100
Burdett & Pond, Old iron, kls., 40,000
Brown Bro. s. & Co. Wire rods, bdls., 720 Rods, coils, 380
Crocker Bros. Pig, tons, 3500
Corbin P. & F. Pig, tons, 50
Drexel, Morgan & Co. Ore, tons, 2205½
Elliott, Sons & Co. Ore, kilogs., 120,000 Ore, tons, 600
Herman H. Castings, cs., 1
Irwin R. & Co. Pig, tons, 200
Lundberg Gust. Scrap, bxs., 600 Bars, 7402
Lee Jas. & Co. Pig, tons, 400 Oxide, bbls., 165
Ogden & Wallace, Bars, 5536
Phelps, Dodge & Co. Bess'r pig, tons, 206 Pig, tons, 460
Pierson & Co. Sheet iron, bdls., 97
Sanders Bros. Pig, tons, 1150
Order, Iron plates, 970 Pigs, 185
Order, Old iron rails, kilos., 460,521 Spiegeleisen, kilos., 50,750 Spiegeleisen, tons, 400 Wire rods, bdls., 5176 Old flange rails, 2118 Ore, tons, 1436 Old rails, pcs., 822 Sheet iron, bdls., 200 Wire, coils, 647 Rails, 1246 Bars, 2116 Old double-headed rails, lot Old fish plates, lot

Steel.

Baring Bros. Blooms, 2 Bessemer rail ends, tons, 118
Barbour Bros. Mach'y, cs., 4
Brown Bros. & Co. Steel, pkgs., 209
Brown Wm. Bundles, 140
Drexel, Morgan & Co. Blooms, 2749
Dolge A. Wire, cks., 2
Merchants' Dispatch Co. Bundles, 117 Bars, 33
Scott Thos. Bundles, 120
Temple & Lockwood, Cases, 4 Bundles, 90 Bars, 22
Witte John G. & Bro. Cases, 3
Order, Blooms, 3605 Bessemer crop ends, tons, 782 Spring steel, tons, 69 Old spring, tons, 88 Bands, 49 Bundles, 23 Casks, 11 Cases, 12 Rails, 154

Metals.

Dickerson, Van Dusen & Co. Tin plates, bxs., 3629 Antimony, cks., 17
Edison F. H. Case, 1
Hendrick Bros. Lead, pigs, 828
Herman H. Brass, cask, 1
Knoepfel & Co. Old copper, pcs., 5 Old metal, pcs., 5
Meyer G. A. & E. Zinc oxide, bbls., 100
Phelps, Dodge & Co. Tin plates, bxs., 4763 Black tag., bxs., 105
Order, Tin ingots, 2441 Tin plates, bxs., 9296 Reg. antmy, cks., 25 Copperware, cs., 2 Old brass tubes, pcs., 923 Lead, pigs, 1618

OLD METALS, PAPER STOCK, &c.

The purchasing prices offered by dealers are as follows:

Copper, heavy	₽ lb.	$0.15 @	$0.16
Copper Bottoms	"	.13 @	.14
Yellow Metal	"	.08½ @	.09
Brass, heavy	"	.11½ @	.12
Brass, light	"	.08½ @	.09
Composition, heavy	"	.14 @	.15
Lead, heavy	"	.04¼ @	.04½
Tea Lead	"	.04¼ @	.04½
Zinc	"	.03½ @	.03¾
Pewter, No. 1	"	.13½ @	.14
Pewter, No. 2	"	.08 @	.09
Wrought Iron	₽ ton.	24.00 @	25.00
Light do	"	12.00 @	.....
Stove Plate	"	12.50 @	13.00
Machinery do	"	15.00 @	15.50
Grate Bars	"	6.00 @	7.00

The prices current (prices paid by local dealers) for Rags, &c., are as follows:

Canvas, Linen	₽ lb.	3½c. @	4 c.
White Cotton, New	"	3½c. @	.....
" No. 2	"	2½c. @	.....
White, No. 1	"	4 c. @	4¼c.
" No. 2	"	3¼c. @	3½c.
Seconds	"	1 c. @	1¼c.
Soft Woolens	"	9½c. @	10½c.
Mixed Rags	"	2 c. @	2½c.
Gunny Bagging	"	1¾c. @	.....
Jute Butts	"	2 c. @	2¼c.
Kentucky Bagging	"	4½c. @	4¾c.
Book Stock	"	2¾c. @	3¼c.
Newspapers	"	1¼c. @	1½c.
Waste Paper and Scraps	"	½c. @	¾c.
Kentucky Bale Rope	"	4 . @	....

PHILADELPHIA.

Office of *The Iron Age*, 220 South Fourth St., PHILADELPHIA, Nov. 1, 1881.

Pig Iron.—The strong tone of the market, as shown in our recent reports, has been fully maintained during the past week, and, in many instances, has developed into higher prices, especially for choice brands of Pig Iron. The best Mill Irons, for instance, are quoted $22 at furnace, and No. 1 Foundry at $25 @ $25.50, to which must be added $1 to $1.50 for freight. This makes pretty high figures, but sellers appear to have full control of the market, and have no difficulty in getting these rates for choice brands. There are others who are willing to deliver in Philadelphia at $22 for Mill Irons and $25 @ $25.50 for No. 1, but these brands have invariably been sold at from $1.50 @ $2 below such makes as we have referred to. Reviewing carefully the entire market, and notwithstanding the great irregularity in prices, there is no doubt that the average advance during the week has been very near 50¢ per ton. This is not more than was expected, and will probably have a tendency to check the speculative feeling which was beginning to manifest itself. Based on the heavy demand for Finished Iron, there was a good deal of urgency to buy Pig metal, but at the advanced rates there will probably be less anxiety in the matter. The position of the trade has in fact been somewhat anomalous during the past four months; Finished Iron scarce, and steadily advancing, while Pig was only very slightly affected. The scarcity of Finished Iron was due to a great extent to the very limited production, owing to heat, &c. The consumption of Pig Iron for the same reason was comparatively light. Now the conditions are changed, the mills are making a larger output, and the demand for Pig is in proportion. It need not, therefore, cause much surprise if the market for Finished Iron takes a turn directly opposite to that of raw material. A good many mills which have been working only half or two-thirds are now running full. Others which have been closed for weeks are now starting up full, and there is no doubt whatever that the current output has vastly increased within the past 30 days. The result will be a steady drain on the furnaces, and while the demand for Finished Iron may show no diminution, the supply will certainly be larger. Hence it is not improbable that for a time Pig will show more strength than Finished Iron. There is a pretty strong impression, however, in many quarters that prices for all descriptions have reached their extreme limit, and that the falling off in demand usual at this season will bring some reaction in prices. The position is difficult to define, however, and will doubtless be influenced to a considerable extent by the character of advices from abroad. If foreign Iron can be kept out, there is a fair chance of maintaining prices; otherwise not. Sales have been made at prices varying from $25 @ $27 for No. 1 Foundry; $23 @ $23.50 for No. 2, and $22 @ $23 for Gray Forge. A 1000-ton lot of Mottled was sold at $20, 1000 tons of No. 2 at $23.50, and several hundred tons Charcoal (hot-blast) at $31. At the inside figures quoted there is now very little Iron available, while the outside rates can be obtained for only a few choice makes, the great bulk of the business having been done at medium figures.

Foreign Iron.—Nothing of importance has been done in English Iron. Lots on the spot are held at about $21, but there is no demand. Scotch sells in small lots at $22.50 @ $23 for Eglinton, $24.50 for Glengarnock and $25.50 for Gartsherrie. Bessemer is unsettled, but quotations of $25.50 @ $26 are still in force. A 5000-ton lot was sold at $25.50, but the higher rates for freight make sellers very cautious, especially for deliveries in the distant future. At shipping points prices are inclined to weakness, but the outlook in regard to freights stands in the way of lower quotations, delivered at American ports.

Muck Bars.—The demand is not as urgent as it was some time ago, and it is difficult to effect sales at prices recently current. Holders ask $45 @ $46 at mill, but there is only a limited demand at about $45, delivered.

Blooms.—The market is steady and prices unchanged as follows: Charcoal Blooms, $72.50; Run-out Anthracite, $60 @ $62.50; $52.50 for Scrap Blooms, and $47.50 for Northern Ore Blooms.

Bar Iron.—There is a steady demand, and the mills have all the business they can handle. There is probably not quite so much urgency to place orders, although stocks are extremely low. Prices have advanced to a point at which buyers feel there is probably something to be gained by waiting, so that orders are cut down to the smallest proportions possible. The increased output which is now being made, as well as the starting up of mills in the West, will steady the market considerably, and there is no apprehension of any further advance in price. On the whole, unless orders can be placed at about 2.7¢, parties are inclined to wait. Consumption shows no falling off, and will probably be heavy during the entire winter, but, as we have said, supplies are likely to be larger, and fully adequate to all requirements. Store prices are 2.9¢, and 2.7¢ @ 2.9¢ covers both extremes of the market. Skelp Iron has been sold in large lots, probably 1500 to 2000 tons in all having been taken. One lot of 1000 tons, sold by Justice Cox, Jr., & Co., brought 3¢ per pound, which may be considered a fair quotation.

Structural Iron.—No business of any importance has been on the market during the week, but old contracts will keep manufacturers busy for some months to come. Prices are unchanged as follows for spring delivery, say 3¢ for Angles, 3.7¢ for Beams, 3.9¢ for Channels and Tees. Earlier deliveries are quoted at 3.25¢ for Angles, 4¢ for Beams, and 4.25¢ for Channels and Tees. Bridge Plates, 3.25¢; Hammered Axles, 3.75¢; Rolled Axles, 3.4¢.

Plate and Tank Iron.—There is no change in prices, and early deliveries command full quotations. Manufacturers have gained somewhat on their orders during the past week or two, however, and, on the whole, buyers can probably place orders on slightly better terms. Still there is an abundance of work to complete, and with the present large consumption, which bids fair to be continued during the entire winter, there is no probability of much change in prices. For delivery after the Christmas holidays some concessions could be obtained from current rates, which are as follows, viz.: Tank Iron, 3.50¢; Refined, 4¢; Shell, 4.25¢; Flange, 5¢ @ 5.50¢; and Fire-box, 6¢ @ 6.50¢.

Wrought Iron Pipe.—There is a heavy demand for all descriptions, and prices are firm at 40 % discount on Boiler Tubes, and 55 @ 57½ % on Gas and Steam Pipe.

Sheet Iron.—The demand is as large as ever, with no immediate prospect of reaction. Most of the mills have still about three months' orders on their books, while stocks everywhere are at lowest point ever known. Prices are steady and unchanged, viz.:

Common Sheet, No 27 and 28	5½¢
Common Sheet, No. 30	5¢
Common Sheet, No. 22 to 25	4¼¢
Common Sheet, No. 16 to 21	4½¢
Best Refined ¼¢ @ ½¢ advance on the above.	
Best Bloom Sheets, No. 26 to 28	7¢
Best Bloom Sheets, No. 22 to 25	6¼¢
Best Bloom Sheets, No. 16 to 21	6½¢
Common Red Plates, 3-16 to 16	3.5¢
Blue Annealed, 3-16 to 16	3.8¢ @ 4¢
Best Bloom Galvanized, discount	30 %
Second quality, discount	40 %

Steel Rails.—The market is steady and prices firm. For 1881 delivery it is difficult to place orders at less than $62.50, and large lots not readily obtainable even at that figure. The first half of 1882 is also pretty well taken up, and $60 is said to be an inside rate. The very large amount of business already entered imparts great firmness to the market, and if there is any change at all it is likely to be in the way of higher prices. The Colorado Coal and Iron Co. have orders for upward of 30,000 tons, prices to be based on rates at Eastern mills at time of delivery, plus freight, which at current rates would make $80 at mill in Denver. Foreign Rails are inquired for, and for immediate delivery would command $62 @ $63 at Atlantic ports. Heavy Rails are offered for January shipment at £6. 5/, f. o. b., for English, and £6 2/6 for Continental. Freights are so uncertain that it is difficult to quote c. i. f. prices, especially for distant months. The entire market, however, may be considered firm at prices varying from $60 to $63, according to time and place of delivery

Steel Blooms.—There is some inquiry, but very few sales have been made during the past week or two. For early delivery $45.50 and upward is asked, while for a later date neither buyers nor sellers are inclined to take the risks of freights and duties. The heavy purchases recently made will probably begin to arrive soon, so that the mills will have plenty of material for the present.

Iron Rails.—There is very little demand, and, with the advance in price of material, prospects are anything but flattering to manufacturers. With the present price for Old Rails, there is not much margin at $48, which appears to be considerably above buyers' views. A sale of 500 tons English 35-lb Rails in store was made at $47, and 56's are offered at $46 in store without leading to business.

Railway Fastenings.—The demand is large, and spot lots of Spikes command 10¢ @ 15¢ per keg premium. General quotations are: Spikes, 3.10¢ @ 3.15¢; Fish Plates, 2.6¢; Bolts and Nuts, 3.25¢ @ 4¢.

Old Rails.—The market has gained additional strength during the week, and under steadily diminishing stocks, prices just as steadily mount upward. With the exception of one 1600 ton lot, we have not heard of any large sales, nor are buyers as yet prepared to pay the extreme rates asked. About $28.50 is bid for Tees for shipment and $31 for Doubles, but there are no sellers at less than $32 and $29 @ $29.50, respectively. There are many inquiries from good buyers, but it is evident that stocks, both here and abroad, are very much reduced and held by strong parties.

Crop Ends.—There is a considerable amount of business under negotiation, but we have not heard of any sales within the past week. There are sellers at about $26 for early shipments.

Scrap Iron—Continues scarce and firm. Choice No. 1 commands $31 @ $32; Medium, $29 @ $30. Foreign for early shipment would cost about $31. Cast is unchanged at about $20.

Nails.—Under light supplies and a heavy demand, prices are steady and unchanged at $3.30, net.

PITTSBURGH.

Office of *The Iron Age*, 77 Fourth Avenue, PITTSBURGH, PA., Nov. 1, 1881.

The great and about the only drawback to general business is the railway blockade, which has been a great source of trouble for some time past, and there will be no relief until navigation is resumed, of which the prospect is favorable at the present writing. Manufacturers, nearly all of whom are pressed with business, are very much worried, as their buyers are pressing them for goods ordered some time ago, but they cannot get cars, and are unable to ship in consequence. Moreover, after shipments are made and leave the depot here, there is no telling when they will reach their destination; points that ordinarily are reached in three or four days now require as many weeks, to the great annoyance of all concerned. There never was a time, perhaps, in the history of Pittsburgh when river navigation was so badly needed as at present, and now that its importance has to some extent been realized, our people begin to see the necessity of river improvement. If the dam at Davis Island proves a success, as it no doubt will, there is a strong probability that the Ohio River will be slackwatered to Cincinnati within a few years, thereby affording Pittsburgh a navigable river all the year, excepting when there is an ice embargo.

Pig Iron.—The general situation remains much the same as a week ago, with the exception, perhaps, that there is an increasing apprehension on the part of some well-informed operators in regard to the upward tendency of values, which they are fearful will not be arrested until importations are started up again from the other side. There is no mistaking that furnacemen generally look for higher prices. Some of them are now refusing to accept current rates, and with the production curtailed by the railway blockade, which prevents a free movement of ore, coke, &c., and a consumption unprecedented in the history of the country, it looks very much as if the expectations of producers would be realized. True, there is an absence of speculation; the demand is for actual consumption, but there is a growing feeling, nevertheless, that the upward move will not be stopped until foreign competition has been started up again, although it is claimed that American Iron can be advanced another dollar or two per ton and still compete successfully with the foreign article. The majority of the mills are pretty well stocked, having bought freely during the past two months. Some of them claim to have enough in yard and bought to arrive to keep them going until the close of the year, and it is very evident from the action of consumers, nearly all of whom have been buying all the desirable qualities they could get hold of for some time past at ruling prices, that they are apprehensive of higher figures. Forge Irons may be fairly quoted at $23.50, 4 mos., for that made from State ores, and $24, 4 mos., for good Neutral from Lake ores; $21 @ $22 for White and Mottled, and $24.50 @ $25 for Red short Cinder Mixture. Foundry grades, $23 @ $23.50 for No. 2, and $25 @ $26.50 for No. 1, the latter for extra anthracite brands. Bessemer is still quotable at $28 @ $29, 4 mos., with a sale of 200 tons at $28.50.

Muck Bar.—There appears to be no abatement in the demand, and, with consumption fully up to the production, there is very little offering, and for immediate delivery prices have gone still higher. We are reliably informed that sales have been made at $46 @ $47, showing an advance of $2 @ $3 per ton within the past two weeks. The prices quoted are considered extreme, but some of the mills are so situated that

they are willing to pay almost any price to get it for immediate delivery.

Manufactured Iron.—There appears to be no perceptible abatement in the demand. It is nothing uncommon to hear of orders having been turned away, and we have no doubt that the volume of business could be considerably increased if the mills were in a position to take all the orders they could get. However, the strike in Cincinnati having been ended will no doubt be felt here within the next week or two, as our mills had been receiving a great many orders, not only from there, but from points that usually draw their supplies from that place. Prices continue firm at full card rates: Bars, 2.50¢, 60 days, 2 % off for cash; Sheet, 4.30¢ for No. 24; Tank, 3.30¢; Hoop Iron, 3¢ @ 3.20¢.

Nails.—The activity noted for some time past continues, and the demand is mainly for near-by delivery. While orders can be placed for next month, manufacturers report that for immediate delivery they have a demand for ten kegs where they can supply but one. Prices firm at full card rates, with the usual abatement and discount.

Wrought Iron Pipe.—The activity noted for several months past continues. Some of the mills have orders enough booked to absorb their entire production until the close of the year. Prices unchanged, but very firm. We continue to quote discounts at 55 @ 57½ % on Gas and Steam Pipe; Boiler Tubes, 40 % off; Oil Well Casing, 85¢ per foot, net; ditto Tubing, 25¢.

Steel.—The mills are all well supplied with orders, as they have been for several months past, and prices are firm, but unchanged. Standard brands Refined Cast Steel, 11¢—11½¢ in a small way: Crucible Machinery, 6½¢ @ 7¢; Bessemer and Open-hearth ditto, 5¢; ditto Spring, 4¢ @ 4½¢; ditto Plow, 4¼¢ @ 4½¢. Those of our mills making a specialty of Boiler Plate have been crowded uncomfortably with orders all this year, and prices are quoted firm at 6½¢ @ 7¢.

Rails, &c.—Steel Rails are still quoted, for delivery this or next month, $62.50 @ $63, cash, at mill; the last sale reported was at $62.50. Spikes unchanged at 3¢, 30 days; Splice Bars, 2.65¢; Track Bolts, 3.75¢ @ 4¢.

Scrap.—There is a fair business in some kinds of Scrap, while others are neglected. No. 1 Wrought, $28 @ $29 per net ton for ordinary, and $30 @ $31 for selected Railroad; Old Car Wheels and Crop Ends, $29 @ $30, gross; Old Car Springs, $38 @ $40, net; ditto Car Axles, $35 @ $37; Axle Turnings, 80¢ @ 90¢ per 100 lbs.; Boiler Plate, $30 @ $32 per net ton; Cast Borings, $15 @ $16, gross; Old Iron Rails, $31 @ $32.

Window Glass.—There is a continued good demand, and prices are firm but unchanged; carload lots, 60 and 20 % on single strength, and 70 % on double, with the usual discounts of 2 % for cash. With two exceptions the factories have been idle for a week past, owing to a strike on the part of some of the skilled workmen. How long the strike will continue is one of those things past finding out; it may not last but a few days, and it may hold out all winter.

Coke.—The great drawback to this important interest is the scarcity of cars. Those operators who do not own cars have been virtually shut out for some time past, and now those who own cars are but little better off, as the railroads are so badly blocked that it is almost impossible to get loaded cars taken away or empty ones brought back. If there was river navigation, a good deal would be sent out for river points and the railroads thereby relieved; the indications are that there will soon be water. Prices remain unchanged at $1.60 per ton, at ovens, to large buyers, and $1.70 @ $1.75 for small foundry orders.

Petroleum.—The raw article has been somewhat depressed during the past week, owing largely to the recent opening up of a new territory in Allegheny County, New York, where a number of new wells are reported yielding from 20 up to 150 bbls. per day, and, as compared with a week ago, prices have declined considerably.

Coal.—There are some 10,000,000 bushels here of Coal ready to be sent to the down-river markets on the first rise, and the indications at present are favorable for a freshet soon. As there have been no shipments by river for more than three months, stocks in the down-river markets are very much reduced and prices are high and tending upward.

CHICAGO.

Office of *The Iron Age*,
36 and 38 Clark Street, cor. Lake Street,
CHICAGO, Oct. 31, 1881.

Pig Iron.—Charcoal Pig Iron continues to be in very good demand, while the market remains firm, with no change in prices. We quote as follows: Calumet No. 1, $28; No. 2, $27; Crane No. 1, $29; No. 2, $28. We quote nominally for Thomas, $28.50 @ $30; Scotch Imported firm at $29 @ $30, and quantity on the market comparatively light; American Scotch, $25.50 @ $28.50; Silvery Soft, $24 @ $26; Lake Superior, Nos. 1 and 2, $31; No. 3, $32; Nos. 4, 5 and 6, $33 @ $34.

Manufactured Iron—Has undergone no change since our last writing. Prices are very firm and the tone of the market good. Stocks are light. We quote: Bar, 3¢; Angle, 3.80¢; T, 4¢; Hoop at 3.80¢ rates; Sheet, Plate and Tank, 10 to 14 gauge, 4¢; 15 to 17 ditto, 4.30¢; 18 to 21 ditto, 4.60¢; 22 to 24 ditto, 4.80¢; 25 and 26 ditto, 5¢; and 27 ditto, 5.20¢. Patent Cold-Rolled Shafting, dis. 20¢; Norway Iron, Original Bars, 4¾¢ rates; Norway Iron, re-rolled, 5¼¢ rates; Ulster Iron, 4¼¢ rates; Low Moor Iron, 8¢ rates; Nuts and Washers, 7¼¢ off list; Wrought Boat Spikes, 4¢ rates.

Nails.—There has been no change to note during the week. We quote for 10d to 60d in less than car-load lots, $3.40 per keg, with the usual deduction for car loads and 2 % for cash.

Steel.—The demand is fairly active; we quote: Tool, 11½¢; Machinery, O. H., 5½¢; Crucible Machinery, 7¢; Hammer, 2 inches and under, 8¢; over 2 inches, 9¢; Cast Spring, 6½¢; and O. H. Spring, Tire and Sleigh Shoe, 5¢. The quotations on this latter class of Steel would be shaded a trifle on large lots. Sheet, first, second and third quality, 12¢, 10½¢ and 8½¢, respectively; Crucible Plow, 6¢ @ 6½¢; Eagle Plow, 5¼¢; Iron Center Plow, 10¼¢; and soft Steel Center Plow, 10¾¢.

Scrap Iron.—A fair business is being done in Scrap Iron. We quote as follows: No. 1 Wrought, $21.50; No. 1 Forge, $24; Heavy Cast, $18, and Stove Plate, $13.

CHATTANOOGA.

Office of *The Iron Age*, Market and 8th Sts.,
CHATTANOOGA, Oct. 31, 1881.

Business is excellent. The cool weather of the week has decidedly stimulated operations in all lines. Dealers in heavy articles complain only that they find difficulty in securing goods to fill orders. The streams are again below boating tide.

Pig Iron.—Trade is quite firm, but the advance of $1 @ $2 per ton announced as having taken place at Louisville within the week is probably "premature." Prices in this district could not fail to be at once affected by a rise so close by. We can only quote our old figures, with the remark that outside rates are those usually obtained. We quote: No. 1 Foundry, $22 @ $23; No. 2 Foundry, $20 @ $21; Gray Forge, $18 @ $19; White and Mottled, $16 @ $18; Car-wheel Metal, $38 @ $40.

Ores.—There is some prospect that difficulty will be experienced by several furnacemen dependent on the general market for their supplies of Ore in obtaining them before next spring. The ill-selected sites of many furnaces is the cause of most of the trouble in getting supplies to them, but the crude methods of mining also has kept the supply low since the demand became large. We quote: 50 % Brown Hematite, per ton, $2 @ $2.75; Red Fossil, $2 @ $2.25, delivered at furnace.

Miscellaneous Articles.—Old Rails $26 @ $28 per ton, mostly shipping demand. Wrought Scrap, $20 @ $25; Cast Scrap, $10 @ $15; Old Wheels, $28 @ $30.

Nails.—The market is very firm. Manufacturers are still crowded with orders, and much annoyed by urgency of patrons to "hurry up." We quote at $3.25 rates, usual discounts on large bills and for cash.

Manufactured Iron.—Bar Iron is strong at $2.75. The mills are all running full, and owing to conservative management during the season of low prices, are getting full benefit of the improved rate. Spikes are very strong, as are all other railroad goods. We quote: Railroad Spikes, $3.30; Track Bolts, $4.25; Fish Plate, $3.

Coal.—We quote Lump at $4.25; run of mine, $2 at mills.

Coke.—Furnace Coke, $3 at point of consumption; Foundry, 10¢ @ 12¢ per bushel.

Steel and Iron Rails.—Steel Bars, $62 @ $64 at mill; Iron, $50 @ $52; Small, $57 @ $60.

BOSTON.

OCTOBER 20.—The cold weather which has set in has enabled the furnacemen to produce more Iron, and while there is yet a considerable scarcity of some desirable brands, it is a far less prominent feature than for some time past. The consumption of Iron continues as large as ever, but there is not so much Iron bargained for in open market, as some consumers are now receiving their supplies on contracts running through the year. Foundrymen are now working steadily, and a great deal of Iron is of course necessary in order to supply their want, and this market cannot be called otherwise than fairly active. The foreign market is still reported very strong, with a good demand, and freights continue to rule high. In consequence of the high prices quoted, the market for foreign Iron is comparatively quiet. American Iron remains as it has been for a few weeks past, relatively cheaper than foreign Iron. The prices for American Pig remain firm, and whether they will rise or fall it is almost impossible to say, when the different views are taken into account. The tendency now is upward. If the foreign market remains steady an advance may be risked here. *American Pig.*—Prices are firm. Prices at shipping ports are: $25 @ $26 for No. 1 X; $22.50 @ $23.50 for No. 2 X, and $21 @ $22 for Gray Forge. Small spot lots command $2 @ $3 per ton above these quotations. *Foreign Pig.*—There is a strong market abroad and freights are high. We quote Eglinton at $24 for large lots and $25 for small; Langloan, $26.50 @ $27; Gartsherrie, $26; Carnbroe and Glengarnock, $24.50 @ $25; Clarence No. 3, $21; Shotts, $26.50 @ $27. *Old Rails.*—There is a better demand than that reported last week. We note a sale of 100 tons at $30. We quote $31 for American and $30 for Foreign. *Manufactured Iron.*—The dealers report an excellent store trade, and are unable to fill their orders promptly from lack of material. In Bar Iron the trade has been first class, and while some of the mills absolutely refuse any orders, others will take them on a basis of $2.90 @ $3. The lowest price quoted in the store trade so far is $2.90, and a great portion of the trade is done on a $3 basis. In Plate Iron the enormous demand continues unabated, and the mills are working to their full capacity. Sheet Iron is experiencing the same excellent trade, and the mills are in the same condition as the others. The Nail companies are doing a continued excellent business and prices are holding very firm. Certain regular sizes are in light supply and the mills are working steadily. To illustrate the demand there exists for Manufactured Iron, we call attention to the fact that Horse Shoes are exceedingly scarce and hard to get, the enormous demand having almost cleared the market of them. The latest advices from the English market for Manufactured Iron represent it as advancing steadily, an advance of 15/ having recently taken place in Bar Iron. The works there are full of orders, and the demand at the advanced figures excellent. Freights are ruling strong and high. Not much foreign Iron can, therefore, be imported to meet the demand which the mills here seem unable to fill. *Bar Iron.*—The market is very firm and higher. We quote $2.90 @ $3 for Bar. Horse Shoes are firm at $4.25 @ $4.33; Swedish and Norway are quoted at $4 @ $5 for Bars, and $4.75 @ $5 for Shapes. *Plate Iron.*—The demand has been very good. We quote Tank at 3⅜¢; Refined at 4⅛¢; Shell at 4½¢; Flange at 5½¢, and Tubes unchanged at 40 % from list. *Sheet Iron.*—There is a continued good demand and prices are firm. We quote: Sheet Iron, 4½¢ @ 4¾¢; ditto Refined, 5½¢ @ 5¾¢; Galvanized, 8½¢ @ 11¼¢; Russia, 11¢ @ 12¢. *Steel.*—The demand has been of good proportions. We quote: Best English Cast, 14¢ @ 15¢; American do., 12¢ @ 12½¢; Bessemer Machinery, 5¢ @ 6¢; Wedge and German, 7¢; English Spring and Calking, 7¼¢ @ 7½¢; ditto American, 5½¢ @ 6¢; Tire, 4¢ @ 4¼¢; Sleigh Shoes, 3½¢ @ 3¾¢. *Nails.*—There is a very good trade, and the light supply of some regular sizes continue. Prices are firm. We quote $3.40 @ $3.50 for 10d. per cask. *Copper.*—The Copper market is steady and there has been a fair trade. Ingot Copper sold at 18¼¢ for large lots, and sales were made in a jobbing way at 18¾¢. Prices of manufactures are unchanged from the recent advance: Sheathing, 26¢; Braziers, 28¢ @ 30¢; Bolt, 28¢; Copper Bottoms, 29¢ @ 30¢; American Yellow Sheathing Metal, 17¢; Yellow Metal Bolt, 20¢; and English Yellow Sheathing Metal, 14¢, in bond. *Lead.*—The market for Pig is easier. Pig Lead can be laid down in Boston at $4.95 for carload lots. We quote: $4.95 @ $5.10 for Pig; Bar, 7¢; Pipe, 7½¢; Sheet, 8¢; Tin lined Pipe, 15¢; Tin Pipe, 35¢, all less 10 %. *Zinc.*—The market is firm. Spelter is scarce. We quote $5.80 @ $6 per 100 lbs. Small lots, $6 @ $6.25. Sheet Zinc is in short supply and has advanced 25¢ per 100 lbs, and is quoted at $7.50 @ $7.75. *Tin.*—Tin is quiet, and is quoted at 21¢ for large lots, and 21¼¢ @ 21½¢ for jobbing lots. *Tin Plates.*—There has been a fair jobbing demand. We quote: Charcoal Bright at $6.50; Ternes at $5.75 @ $7.25; Cokes, $5.50 @ $5.75; ditto Ternes, $5.25 @ $5.50.—*Commercial Bulletin.*

LOUISVILLE.

Messrs. GEO. H. HULL & CO., Commission Merchants, report to us as follows, under date of Oct. 28, 1881: The market is very active, and has advanced from $1 to $2 per ton on Hot blast grades within the last week. Nearly everything offered at reasonable prices is promptly taken. The extent of the business is only curtailed by the unwillingness of manufacturers to make prices, being so largely sold ahead. We quote for prompt cash as below:

FOUNDRY IRONS.

No. 1 Hanging Rock, Charcoal	$28.00 @ 29.00
No. 2 " "	27.00 @ 28.00
No. 1 Southern, Charcoal	26.00 @ 27.00
No. 2 " "	24.00 @ 25.00
No. 1 Hanging Rock, Stonecoal and Coke	26.00 @ 27.00
No. 2 Hanging Rock, Stonecoal and Coke	24.00 @ 25.00
No. 1 Southern, Stonecoal and Coke	25.00 @ 26.00
No. 2 " " "	24.00 @ 25.00
"American Scotch"	23.00 @ 25.00
Silver Gray	22.00 @ 23.00
Scotch	@

MILL IRONS.

No. 1 Charcoal, Cold-short and Neutral	@
No. 1 Stonecoal and Coke, Cold-short and Neutral	22.50 @ 23.00
No. 2 Stonecoal and Coke, Cold-short and Neutral	21.50 @ 22.00
No. 1 Missouri and Indiana Red-short	26.00 @ 27.00
White and Mottled, Cold-short and Neutral	18.00 @ 19.00

CAR WHEEL AND MALLEABLE IRONS.

Hanging Rock, Cold-blast	35.00 @ 38.00
Alabama and Georgia, Cold-blast	34.00 @ 37.00
Kentucky Cold-blast	34.00 @ 36.00
Hanging Rock, W. B.	30.00 @ 33.00

W. B. BELKNAP & CO., Iron and Steel Merchants, Nos. 113 and 115 Main street, report to us as follows, under date of Oct. 29: The market for Finished Iron is in the same condition as last writing—firm, but with no speculative tendency manifesting itself, as the idea is general that prices will hardly go higher. We continue quotations—2.70¢ @ 3¢ card, according to size and assortment. Every mill bearing on this market is running double turn and turning out a large product, so if we had the Cincinnati mills in addition, the strain for immediate delivery would be largely removed. Sheet and Plate are still hardest to get in quantity of anything on the list. Nails stocks are badly broken, but the price has not correspondingly advanced. Indeed, Nails in some instances are selling below manufacturers' card, though on new orders we must pay the latter. Coal is high, owing to long-continued low water in the Ohio. It is selling at from 14¢ to 16¢ per bushel from barge in large quantities.

CINCINNATI.

OCTOBER 31.—*Pig Iron.*—The market continues firm, and there has been an active demand for current consumption. The supply and demand show a very wholesome and satisfactory state of things. The sales at the close of the week were: No. 1 Hanging Rock Charcoal Foundry, $28 @ $29; No. 1 Coke, $26 @ $26.50; No. 2, $24.50 @ $25; Stonecoal S. G. Softeners, $22.50 @ $25; Cold-blast Charcoal Car-wheel Irons, $35 @ $38; Warm-blast, $28 @ $35. The rolling mills of this district are all to resume work this week under an agreement with the mill hands that they accept the scale of prices they were getting at the time when they struck for more pay (June 1), and a further condition that on the 1st of June, 1882, they are to continue work at flat Pittsburgh prices. The above is said to be substantially the present arrangement. The mills, not being incumbered with orders, will be able to accept them freely and make prompt deliveries. This view of the situation has had much to do in persuading the mill hands that it is better that they accept old prices now on the prospect of steady employment through the winter.

ST. LOUIS.

Messrs. HOFFER, PLUMB & CO., Pig Iron and Iron Ore Merchants, 417 Pine street, write us, under date of October 29: The demand is very good and prices are firm at the following cash quotations:

HOT BLAST CHARCOAL.

Missouri	$27.00 @ 28.00
Southern	27.00 @ 28.00
Ohio	29.00 @ 30.00

COAL AND CORE.

Missouri	27.00 @ 28.00
Southern	26.00 @ 27.00
Ohio	27 50 @ 28 50

MILL IRONS.

Cold-short	23.00 @ 24.00
Red-short	25.00 @ 26.00

CAR WHEEL AND MALLEABLE IRONS.

Missouri	28.00 @ 34.00
Southern	35.00 @ 38.00
Ohio	32.00 @ 40.00

BALTIMORE.

R. C. HOFFMAN & Co., Iron and Commission Merchants, report the Pig Iron market as follows, under date of October 31: The month closes with but little change in the Iron market. The demand continues heavy and prices very firm. We quote as follows:

Baltimore Charcoal Wheel Iron	$36.00 @ 38.00
Virginia C. B. Wheel Iron	26.00 @ 38.00
Anthracite No. 1	25.00 @ 27.00
" No. 2	23.00 @ 24.00
" No. 3	21.00 @ 22.00
" Mottled and White	19.00 @ 20.00
Charcoal C. B. Blooms	70.00 @ 72.00
Refined Blooms	57.00 @ 62.00

W. N. WYETH, Iron and Steel Merchant, 46 and 48 South Charles street, reports us the following, under date of October 31: Business for the past week has ruled very active, with the demand fully equal to the supplies. Values firm and unchanged.

Ref. Bar Iron, 1 to 6 x ⅜ to 1	₩ lb 2 8-10 @ 3 ¢
" " 1 to 4½ x 1⅛ to 2	₩ lb 2 8-10 @ 3 ¢
" " ¾ to 2, Round and Square	₩ lb 2 8-10 @ 3 ¢
Hoop Iron, 1⅛ wide and upward	" 3½ @ 3¾¢
Band Iron, from 1¼ to 4 in. wide	" 3 @ 3¼¢
Horse-shoe Iron	" 3¼ @ 4 ¢
Norway Nail Rods	" 5½ @ 6 ¢
Black Diamond Cast Steel	" 13½ @ 14½¢
Machinery Steel	" 9 @ 9½¢
Cast Spring Steel	" 8 @ 8½¢
Common Horse Nails	" 10 @ 14 ¢
Perkins' Horse shoes ₩ keg of 100 lbs	$4.37½
" Mule shoes	5.37½

RICHMOND.

Mr. ASA SNYDER, Iron Merchant and Furnace Agent, writes as follows under date of October 30: The business of the closing month has been very satisfactory to all branches of the Iron interest. Ruling prices are firm, and an advance is demanded for future deliveries of leading brands of Pig Iron. Quotations as follows:

No. 1 Scotch Pig Iron	24.00 @ 27.50
No. 1 Anthracite Pig Iron	24.00 @ 27.00
No. 2 "	22.00 @ 24.50
No. 3 "	21.00 @ 22.50
No. 1 Virginia Coke Pig Iron	23.00 @ 24.00
No. 2 " "	22.00 @ 23.00
No. 3 " "	20.00 @ 22.00
Virginia Charcoal B. C. Wheel Iron	34.00 @ 36.00
Wrought Scrap, No. 1	23.00 @ 24.00
Cast Machinery Scrap	20.00 @ 21.00
Refined Bar Iron	@ .03
Horse Shoes (Tredegar)	@ 4.00
Mule "	@ 5.00

Our English Letter.

Review of the British Iron, Steel, Metal and Hardware Trades.

(*From our Regular Correspondent.*)

LONDON, ENG., Oct. 17, 1881.

THE IRON TRADE

has been stationary in most respects since the date of my last report, but while saying that, I am not to be understood to mean that there has been any retrogression. As a matter of fact there has been no going back worthy of the phrase. All that has happened has been caused by the not unwise impression that a little breathing time would be discreet and useful. That being the case, there have been no further advances in raw materials or ordinary manufactured iron, the various alterations and changes chronicled during the week having been on the part of firms who had not before brought their quotations up to the level of their competitors. Hardwares and miscellaneous manufactures, in the same way, are being raised in proportion to the advances in iron, but these are effects and not prime causes. Taken as a whole, therefore, it may be said that our iron market has fully maintained the advantages gained a fortnight ago, besides which there is an undoubted and strong disposition on the part of iron producers to impose additional advances. Some of them have been persuaded to wait a little before again putting up their figures with much difficulty, especially as it is clearly seen and proven that most of the works are exceedingly busy. Good advice is forthcoming, however, in all directions, and the ironmasters are almost implored to act prudently, and to refrain from making further increments for the present. In some quarters they are keenly criticised for the adoption of the policy of restriction, which is termed an infraction of the vital canons of free trade. At the annual dinner of the Iron and Steel Institute in London last week, for instance, the following little passage of arms took place between Mr. I. Lothian Bell and Mr. Thomas Hawksley, one of our leading civil engineers. Mr. Bell said: "At first sight it may appear to be inconsistent with the dictates of political economy that the ironmasters in that or any other part of the county should enter into what has been described as a species of conspiracy against the consumers. No such idea for one moment entered our heads. During the last 15 months at least we have experienced in an unmistakable and unpleasant way the fact that the world was incapable of consuming all the iron we were producing. Now, it is quite idle to contend that the iron trade or any other trade can go on producing material which the world has no immediate prospect of consuming. (Hear, hear). We found our stock of iron during the last 15 months increased something like 70 per cent. I am free to admit it was a matter which required grave consideration. I ask my colleague to consider himself in the position of sole proprietor of all the blast furnaces in Cleveland and Scotland, and finding that one-tenth of his entire work was lying on a furnace-bank, whether it would be any outrage on the canons of political economy to cease to make that for which the world had no necessity. That was a dictum accepted by my colleagues *nem. con.* Having established that as a sound principle, I ask wherein lies the difference of one man committing and 20 or 40 agreeing together to do the same thing? The idea of restricting the make for the purpose of falling into the error spoken of by my friend was the last thing in our minds, and the very last thing we hope to see accomplished."

To this Mr. Hawksley, a sage elderly gentleman, rejoined: "I have now a 'crow to pluck' with Mr. Bell for having misrepresented me in his own agreeable fashion. I think you have erred seriously against one of the great canons of political economy for combining—for it is nothing but a combination—to reduce the make of iron. (Laughter.) All combinations of that kind I consider to be detrimental to all concerned, as well as to those outside them. (Hear, hear.) Now for the reasons. My friend illustrated his little argument (a laugh) by saying you are making too much of the material which you have to dispose of. That is very true. But then why don't you make less? The man who was making 10 per cent. more iron than was demanded by the public, could have made only 9 per cent. if he choose. But you did not choose, and you thought to enter into a combination for that purpose. Now, what was the object of the combination? The object of the combination was not to reduce the make of iron, but to increase the price of iron. (Hear, hear, and laughter). I dissent from combination for that purpose. Iron has been sold at much too low a price. (Hear, hear.) You know you must have been great somethings—I won't say what is passing in my mind—(a laugh)—to have sold it. But you don't need combination. My objection to combination is that it interferes with free trade and fair trade. (Laughter.) It interferes with both, and in that sense it is against what my friend called the first canons of political economy. Now, I am decidedly of opinion that the late price—and, indeed, the present price, notwithstanding that there has been a considerably increased price ruling during the last month—the price obtained is less than a fair price. (Hear, hear). I admit that. But you must be subject to all the incidents of trade, of which combination is not one. There I think my friends will agree with me. (Mr. Bell shook his head). He said to me in private: 'We found the make was too great, and that it was desirable to restrict it.' I said, 'Yes, I thought it was.' But I answered, 'The real object is not acknowledged; the real object is to create an artificial instead of a natural price, and in that respect you are again erring against the first canons of political economy. Everything in trade ought to be just, honest and true; for when trade is not just it cannot be essentially natural.'"

Mr. Bell was supported by Mr. Cowper, president of the Society of Mechanical Engineers, who characterized the policy of restriction as a "combination for good." At all events, the limitation of the make is being continued despite these criticisms and the growing opposition of the coal miners of Scotland and the ironstone miners of the North of England. The prospects of the iron trade are believed to be good by excellent judges, always assuming that prices are not "rushed" by or in favor of the speculators. Earl Granville, our Minister for Foreign Affairs, himself a large ironmaster, speaking last week, said: "I believe a better prospect is opening to us, and so much do I believe it that I am afraid at this moment of our going too fast, rather than of our going too slow. (Hear, hear.) I have a painful recollection of the leaps and bounds by which trade advanced in 1873, and we can hardly have forgotten what, within the last two years, was called the American 'boom.' It was very pleasant at the time. In my part of the world the price of coal was raised; then iron, then coal, then iron. Then the speculators rushed in with that energy which they always show in a rising market, and the result was almost a complete collapse in two months' time. I trust we shall be moderate this time; I believe we are justified in thinking that demand will overtake and perhaps pass supply, and that we are entitled to the remuneration we have so long waited for. If only we keep our heads cool, and are not in too great haste to raise prices, we shall see a long period of prosperity in this trade."

Reverting for a moment to my *mouton*, I may note that in Scotland warrants have suffered a little on the week, but closed rather better, and are being fairly well held at the moment. There is a large amount of speculation on hand, however, so that the course of Glasgow Warrants is not a safe or sure indication of the market. Elsewhere prices have been very stiff, especially on the West Coast, where mixed lots of hematites have gone up 1/6 @ 2/6 per ton, in the face of a very strong demand and heavy shipments. Many of the smelters there now ask 65/ @ 67/6 for No. 1, but mixed lots may be called 61/ @ 62/6. Finished iron is steady—indeed three-fourths of the makers have withdrawn their open quotations and will only sell by special negotiations. Iron rails are steady and in strong request for your market. The sections mostly sought after are 16, 20, 25 and 35 pounds, which are £5. 10/ @ £5. 15/ per ton, with nothing available for prompt deliveries. The Tredegar works are abandoning iron for steel rails. Cyfarthfa is still idle. For old rails there is an urgent American demand, at £4. 7/6 D. H. and £3. 19/6 for flanges, c. i. f. Philadelphia, but the smallness of stocks and the rise in freights keep transactions down. Heavy wrought scrap is quoted £4, c. i. f. New York, and business has been done during the week on that basis. For rail crop ends a sudden "boom" has come along, and many lots for the United States have changed hands up to £3. 10/, f. o. b. Your inquiry for old railway leaf-spring steel is unabated at £6 per ton, steam c. i. f. New York. Many thousands of tons of Bessemer blooms for future deliveries have been sold at £5. 12/6 @ £5. 15/, and the demand is still strong, but producers are declining to enter into further contracts. Steel rails are very stiff—so firm, indeed, that little new business is being done. Makers are full of work, with an abundance of orders on their books, and resolutely decline to entertain long-dated contracts, owing to the enhanced and growing values of all kinds of materials. As a matter of

fact, it seems that the whole of the rail mills have work assured for the next four or five months; hence the prospects of this branch of business are of the brightest.

THE QUARTERLY MEETINGS

held last week were largely attended, and were of much interest, owing to the circumstances that some little uncertainty existed as to the course of prices. The Institute meeting in London kept some of the ironmasters away, it is true, but as they were all represented the gatherings in question cannot be said to have suffered much in consequence. The meeting at Middlesborough on Tuesday was characterized by a firm and steady tone, the large current shipments and reduced production tending to render the smelters sanguine. It was reported, at the same time, that the majority of the local iron and steel works are busy, with orders on hand sufficient to carry them well forward into the winter. At the Wolverhampton meeting on Wednesday it became known that neither crude nor finished iron would be advanced early in the day, so that the "keen edge of expectation" was somewhat dulled. The situation was much canvassed, nevertheless, and there seemed to be an impression that, just prior to the incoming of November, coal as well as iron will be further advanced—coal, 1/; pig iron, 5/, and bars, 10/. Acting upon this idea, the venders present preferred small and prompt orders only, and declined to bind themselves down to deliveries beyond the end of this month. The net result of such opinions was the minimization of the amount of business done, save in those instances where buyers agreed to accept deliveries at the prices obtaining at the time such deliveries may be made. The sheet iron manufacturers occupied the strongest position, perhaps, as they refused to quote at all, and declared themselves out of the market. Since the meeting, they have issued circulars, in some cases notifying a rise of 20/, in others withdrawing their open prices. Singles were quoted £8. 10/; boiler plates, £9 @ £10. 10/; common bars, £6. 10/ @ £7; marked bars, £7. 10/; galvanized iron 24 W. G., £14. 10/ in bundles, London or Liverpool; 26 W. G., £16. 10/, and 28 W. G., £18 @ £18. 10/. These last rates are all nominal and the makers are now holding out for 20/ more.

The Birmingham meeting on Thursday was fairly attended, but the business done was rather less than had been expected, bearing in mind the steadiness of selling prices. The large buyers seemed to have thought little of the rumored probable rise, and declined to be frightened into purchasing ahead of their actual requirements. There was just a suspicion that the consumptive demand is not pressing, and some of the consumers acted up to that opinion by withholding their commissions. The galvanizers bought freely of sheets for next year's business, and their own orders on export account ran in large lines of 500 to 1000 tons each. Lord Dudley was reported to have received good orders from the United States. The tin-plate manufacturers met and received what are said to have been satisfactory reports as to stocks, and, in view of the enhanced values of materials, fixed the minimum quotation for I C cokes at 17/. In spite of this, however, I hear of sales having been effected at 16/6 per box.

THE INSTITUTE MEETING,

which began on Tuesday, October 11, and ended on Friday, October 14, was an exceedingly successful affair—the most decided hit the iron and steel men have as yet made. The programme was very attractive from all points of view, the more solid portions of the bill of fare being sandwiched in, as it were, between a liberal allowance of lunching, dining and excursions. As you are aware, it is not usual to hold the autumnal meeting of the Institute in London, seeing that the spring assembly of the members invariably takes place here. It was originally intended, I believe, to visit Sweden this autumn, but for several reasons the idea was abandoned, as was also the subsequently formed intention of going to Sheffield. Nobody can now possibly regret the holding of the meeting in London, which has entertained the members in the most handsome and sumptuous manner. Much of the *éclat* and success of the session is undoubtedly due to the Local Reception Committee, headed by Sir Henry Bessemer and Dr. Siemens. This committee provided a luncheon daily, and entertained the members at a conversazione within the South Kensington Museum, besides opening up visits to various works, &c., and organizing special trains. The Lord Mayor entertained the company at a banquet held at the Mansion House on the Tuesday, and next evening there was the annual dinner at Willis's Rooms. To finish up there was an excursion to Brighton—just now "in season." So much for the junketing. The papers read and the resulting discussions were most interesting, particularly the reports as to the dephosphorization, and the lively passage of arms between Dr. Siemens, Sir Henry Bessemer and the Woolwich authorities. Scarcely less appreciated was the paper by Capt. Jones, of the Edgar Thomson Steel Works, whose facts and figures were listened to by a large audience, many members of which were evidently surprised to learn that you are so far advanced in rolling mill practice. As you have all the papers, &c., I need not dwell upon the subject of the meeting at greater length here.

SCOTCH PIG IRON

has been fairly steady, with a large speculative business in warrants, which have fluctuated, consequently, day by day. On Oct. 10th they were quoted 51/6 @ 52/2; 11th, 51/3 @ 52/3; 12th, 51/11 @ 51/2; 13th, 52/4½ @ 51/9; and 14th, 51/10 @ 52/4. There are 105 furnaces at work, as against 111 this date a year ago, but the former total includes 10 running on hematites. There were 3592 tons added to Connal's stocks last week (doubtless in order to get warrants for the iron), and the reserve there now amounts to 598,460 tons, against 474,817 tons a year ago, and 495,850 tons at Christmas last. Shipments were rather better than last year, but they have decreased this year to date by 97,568 tons. Imports from Middlesboro' into Scotland are increasing, and have grown to date this year by 41,736 tons. Ballast pig iron is 47/6 per ton alongside, and freights 11/ @ 12/ steam to New York. Writing from Glasgow, Oct. 14, James Watson & Co. said: "The Scotch iron market has been very firm this week, with a large speculative business doing. The demand for makers' iron is only moderate and prices are steady. On Monday the price of warrants opened at 51/6 and advanced to 52/5, closing at 52/2 per ton. On Tuesday the market commenced at 52/ and advanced to 52/3; afterward becoming flat, it dropped to 51/3, cash. On Wednesday the market was irregular, with a fair business done between 51/2 and 51/11, closing at 51/8 per ton. Yesterday a moderate business was done between 51/9 and 52/4½, closing at 51/11 per ton. To-day the market was firm, with a fair business done between 51/10 and 51/4 per ton, closing with sellers at 52/1½ per ton. The shipments last week were 11,102 tons, as compared with 10,055 tons for the corresponding week of last year." We quote:

	No. 1.	No. 2.
G. M. B., at Glasgow	53/	50/
Gartsherrie, at Glasgow	61/	53/
Coltness, "	62/	53/
Summerlee, "	61/6	52/
Langloan, "	63/6	53/6
Carnbroe, "	55/	51/6
Calder, "	61/	53/6
Glengarnock, at Ardrossan	55/	51/6
Eglinton, "	53/	49/3
Dalmellington, "	53/	49/6
Shotts, at Leith	62/6	53/6
Kinneil, at Bo'ness	52/6	50/
Carron, at Grangemouth	53/6	53/

CLEVELAND IRON

has been firm, and appears likely to remain so. The shipments of pig from Middlesboro' this month bid fair to surpass those of any previous month this year. Current figures G. M. B., net cash (less 2½) f. o. b. makers' wharves in the Tees, are:

No. 1 Foundry	47/	Mottled	41/6
2 "	45/	White	40/6
3 "	43/	Refined Metal	61/
4 "	42/6	Kentledge	43/
4 Forge	42/		

Bolckow, Vaughan & Co.'s Eston Steel Works are said to be producing 5400 tons of ingots weekly, and 4300 tons of rails from two mills. The official report of the Middlesboro' Chamber of Commerce states that the founders, engineers, bridge builders, galvanizers, wire rollers, shipbuilders, &c., are all well employed. An advance of 6 per cent. has taken place in cut nails, official quotations for which are: Clasp, rose, clout, tip and sacking, per cwt., ¾ inch, 16/6; ⅞ inch, 15/; 1 inch, 14/; 1¼ inch, 12/; 1½ inch, 11/; 2 to 2¼ inches, 10/; 2½ to 2¾ inches, 9/6; 3 to 6 inches, 9/; above 6 inches, per cwt. extra, 1/. Joiners' brads, per cwt., 1 inch, 15/; 1⅛ inch, 14/; 1¼ inch, 13/; 1½ to 1¾ inch, 12/6; 2 to 2¼ inches, 11/; 2½ to 2¾ inches, 10/6; 3 inches and above, 10/. Flooring brads, per cwt., 2 inches, 9/3; 2¼ inches, 9/; 2½ inches and upward, 8/9. Lath nails, per cwt., ¾ inch, 13/; ⅞ inch, 12/; 1 inch and above, 11/. Colliery plate nails of first-class scrap, warranted, per cwt., 2 to 2¼ inches, 10/; 2½ to 2¾ inches, 9/6; 3 inches and upward, 9/. Terms, cash monthly, less 5 per cent. in 30 days from date of invoice, on trucks at works.

WEST COAST HEMATITES

remain very firm; indeed they may be said to be gradually hardening in price, under the influence of a sustained enormous demand. Forward deliveries are only to be had by paying even higher rates than those current, which are:

	No. 1.	No. 2.	No. 3.
Cleator	65/	63/	62/
Lonsdale	62/	61/	60/
Workington	62/	61/	60/
West Cumberland	62/	61/	60/
Lowther	62/	61/	60/
Moss Bay	62/	61/	60/
Distington	62/	61/	60/
Harrington	62/	61/	60/
Solway	62/	61/	60/
Maryport	63/	62/	61/

Mixed parcels of Nos. 1, 2 and 3, 61/ @ 62/6 for prompt cash. There are 61 furnaces in and 20 out. Shipments last week were 20,320 tons of pig iron and 7755 tons of rails and blooms. These figures indicate the approaching close of the Canadian and Russian shipping season. Ores are unchanged at late rates. The Barrow Works are excessively busy on rails, blooms, plates, and railroad materials of all kinds.

FOREIGN.

FRANCE.

(Moniteur des Interets Materiels.)

PARIS, Oct. 15, 1881.—*Metals.*—The active season is at hand, and everything tends to favor a large business in the provinces, hence Metals also have looked up again and are all higher. We quote at the close: *Copper.*—Chili Bars, 163.75 @ 167.50; Ingots and Slabs, 172.50; Best Selected, 177.50, and pure Corocoro Ore, 162.50. *Tin*—Banca and English, 265; Billiton, 263.75, and Straits and Australian, 262.50. *Lead*, 39 @ 40. *Spelter*, 44.50 @ 45 francs per 100 kilos. *Iron.*—Quite a rise has taken place in the Iron market likewise. Rolling mills in France are overwhelmed with orders; some have sold ahead their entire output for six months to come. In the face of this steadily upward movement the large Iron dealers in this city are now very anxious to secure some more, but after having hesitated so long, they do not find it easy now to buy on terms exactly as they would like to do. There is great activity in the Ardennes district, but at their last meeting makers have agreed not to raise their price list. The strike of boiler makers' operatives in the Bouches du Rhone district has terminated; metal workers seem to prepare for a strike there at present. In the Haute-Marne the late drought had interfered with work, but it is now resumed with all the greater vigor. Makers have more orders on hand than they can conveniently attend to. Coke Merchant commands in the district 20 francs, and Mixed, 21.50 @ 22; the Eurville rolling mills even insist on more. In the Loire and Rhone some specialties in the Iron line are higher. In the Meurthe and Moselle the Longwy furnaces have raised Foundry Pig to 8 francs for No. 3. At the North there were sold during the week in the Sambre Basin some 80,000 tons of Iron. We quote at Paris at the close: Common Merchant Iron, 19 @ 19.50, and Charcoal ditto, 20 @ 22. *Coal*—Is more active, especially at St. Etienne, but prices remain the same.

BELGIUM.

(Revue Universelle.)

BRUSSELS, Oct. 16, 1881.—*Iron.*—As the month advances it is becoming brisker. Thus expert orders have also dropped in both from England and Russia. Pig Iron is gradually improving. There is much pressure to obtain delivery without delay, and in many instances extra prices are offered for such, but the bulk of Iron works in Belgium are so crowded with orders that they are compelled to decline any fresh ones to be attended to at once. Sheet Iron in particular is in request, and its price has been pushed to 18.50 francs. Beams likewise remain in favor. They now currently sell at 15 @ 16. As they are scarce, the price may be advanced soon above this figure. Common Merchant Iron sells with ease at 12.75 francs for No. 1. Corners are worth 15; Steel Rails, 18; Steel Hoops, 24; and ditto Axles, 25. Structural Iron concerns have their hands full. One firm has received orders enough to last for fourteen months to come; another 5,000,000 francs worth; another 4,000,000 francs worth. If we were in the month of March instead of being in October, so near the usually dull winter spell, prices would advance. As it is, makers in general do not like to push up prices too fast. They are doing well now, and do not wish to frighten away business by exaggerated pretensions. At this juncture it may not be without interest to show the Belgian Iron movement during the first eight months:

	Importation.		Exportation.	
	1881. Tons.	1880. Tons.	1881. Tons.	1880. Tons.
Raw cast steel	1,158	615	708	602
Ditto in bars	5,309	3,621	22,843	17,737
Wrought steel	1,104	724	1,979	1,384
Iron ore	771,010	568,198	237,652	195,029
Pig iron	116,632	142,340	11,046	8,401
Old iron	3,821	9,211	20,779	28,051
Iron wire	3,379	2,575	3,950	3,039
Rails	208	548	20,576	20,177
Sheet iron	249	217	23,410	18,926
Other iron	5,152	4,895	97,535	110,059
Nails	245	304	5,815	7,052
Wrought iron	3,041	2,292	14,742	13,553
Castings	4,814	6,881	10,797	6,436

Coal.—Some mines have fixed their price at 16 francs for mixed Coal. The demand for Coal for France is very active, and the tendency is an upward one. Industrial Coal sells at 7 @ 7.50; best quality for households, 20 francs.

GERMANY.

(Borsenhalle.)

HAMBURG, Oct. 16, 1881.—*Iron.*—Attention centers just now upon Pig Iron in the German markets, consumption thereof being unusually large and the English advance influencing favorably German makes. The better kinds of Pig, in particular, are in brisk request, but the lower grades are by no means neglected. A fresh advance of 2 marks has been effected in Foundry and Bessemer Pig. This extraordinary animation in Pig Iron is not confined to the Rhenish provinces and Westphalia, but extends equally as much to Upper Silesia. Blast furnaces in the latter province hold back and are disinclined to go on making large contracts for delivery ahead. Merchant Iron has undergone no further change, although the demand is as lively as ever. Should Pig Iron advance any further, Merchant will have to follow. A good demand is noticeable for Sheet Iron, Hoops, Pillars and Wire at unaltered prices. Boiler Sheets are very much wanted. *Metals.*—The general tendency is upward, but dealings are moderate in extent only. We quote: Lead, higher with sales at the advance; English Pig, 17 @ 17.20; ditto Sheets, 17.25 @ 17.50; German Pig, 15.30 @ 15.50, and Spanish, 18.20 @ 18.40. Copper is firm; Calumet Hecla, 79 @ 80; other sorts, 69 @ 76. Tin is higher within the range of 1.05 @ 1.10; Spelter is inanimate, but firm at 16.25 @ 16.50. Breslau quoted 12 instant Godulla, Oct. delivery, 15.80, paid, and Union, October delivery, 15.70 marks per 50 kg., paid.

RUSSIA.

(Journal de St. Petersbourg.)

ST. PETERSBURG, Oct 11, 1881.—*Iron.*—A project seems to be on foot on the part of the government to raise the import duties on Iron again. Since this has become known there has been great stagnation in the Russian Iron markets in view of these uncertainties. The government proposes this enhancement in order to protect Russian makers still more fully than is the case at present. It is to be hoped that a resolution may be arrived at without any further delay, for the suspense that our merchants are kept in is very injurious, not only to them as importers, but also to the government, for many of the latter will hesitate to order with this undetermined question before them, the more so as changes in the duty go into operation at once, and dealers who may have ordered or who may order are apt to decline the foreign Iron with a heavier duty on it. The fact is that the government ought to give timely notice of similar intended changes now and in the future, instead of preparing surprises involving loss to the consumer.

AUSTRIA.

(Austrian Trade Journal.)

VIENNA, Oct. 16, 1881.—*Iron.*—There has been no particular change. The demand for leading articles in the line has remained brisk, only a few specialties being duller. The advance in Bohemia and Hungary alluded to in our last report has been carried out and maintained, but the great Styrian works have not raised their prices. The latter declare that it is not in their interest to do so, for they would thereby only do a favor to Bohemian and Moravian makers, their main competitors. They are, besides, so busy in perfecting the consolidation often alluded to by us that they do not trouble themselves about the market just at present. Pig Iron improves steadily, and an advance seems to be impending in this neighborhood, too. Sheet and Structural Iron and all sorts of Steel are active. Steel-rail works are busy. There is no change in prices since our last.

HOLLAND.

(Koch & Vlierboom.)

ROTTERDAM, Oct. 14, 1881.—*Tin*—Has at first been unfavorably influenced by the rise in the discount rate, Banca declining to 57.75 guilders per 50 kilos., and Billiton to 57.25, but the rebound soon followed quickly, and since then the market has recovered rapidly, Banca now being worth 58.75, and Billiton 58.25, after a good many sales. Little Tin is now offering. At 25¢ below the closing quotation large lines might be placed without much difficulty. *Lead.*—Stolberg sold at 9.25 guilders, and F. C. B. at 9.06¼. P. S.—Oct. 16.—Since the foregoing was written the demand both for consumption and speculation has increased, carrying the price to 59.50 for Banca, 58.75, Billiton, spot, and 59.50 Billiton, January delivery.

EAST INDIES.

(Hessenauer & Co.)

COLOMBO, CEYLON, Sept. 16, 1881.—*Plumbago.*—Some business has been done at the ensuing quotations: Ordinary Lump per ton, 110 @ 135 rupees; ditto chips, 60 @ 75, and Dust, 40 @ 55; total exports to all quarters since Oct. 1, 186,107 cwts. against last year, 204,069; in 1879, 138,007, and in 1878, 64,099. *Exchange*, 6 months, 1/8⅝.

(Dummler & Co.)

BATAVIA, JAVA, Sept. 2, 1881.—*Tin.*—The Billiton sales of 23d ult. of 12,834 picul's average 61.90 guilders per picul. The next sale of 11,000 to 14,000 piculs will come off on Oct. 25, and the next three of about the same quantity each on Dec. 27, Feb. 28 and April 28, imported. *Metals.*—Swedish Iron sales at 9.50 @ 10 guilders. English Bars have been transacted at 6.75, but the market continues exceedingly dull, galvanized Corrugated Sheets slowly selling at 14. No sales of Copper Sheathing. *Coal.*—Very difficult of sale and in large supply. *Exchange*, 6 months, London, 11.87½ @ 11.90 guilders per £.

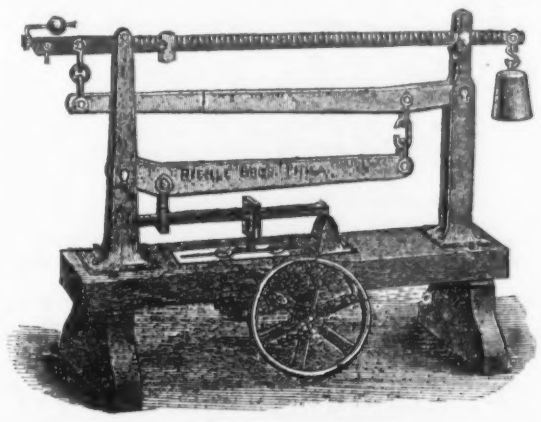
CHILI.

(Weber & Co.)

VALPARAISO, Aug. 29, 1881.—*Copper*—It seems that producers cannot lower their pretensions sufficiently to conform to the rate of exchange here and the ruling in the European Copper market, both of which items ought to depress the price here, for they, most of them, prefer to ship for their own account rather than subscribe to figures they consider ruinous. In this manner sales have not exceeded 2586 quintals. Bars at $17.30 on shore here, and Lambert at $17.70 on board at Coquimbo. For a lot of Chanaral, to go per steamer Britannia, $17.45, on board, was offered, but declined; to-day this price would not be obtainable, the exchange having risen since. Nobody would pay more than $16.75, on shore, to-day. *Nitrate.*—Sales since the 10th instant have summed up 250,000 quintals, at $2.85 @ $3.10 for 95 and 96 %. There is but little offering. Producers at Antofagasta and Tattal have sold out pretty much all their stock, while holders at Iquique hold back, counting, as they do, on better prices and lower freights. The asking price for 96 %, with 1¼ % salt, is $3.05 at the close. Charters since the 10th instant have been 10,300 tons for Europe. As for the Tattal duty question, the petition of the Tattal and Aguas Blancas Saltreros has been submitted to Congress, asking for a prolongation of duty-free export. The Secretary of the Exchequer has announced that the thing has first to be taken into consideration. There is now a rumor that the government intends to grant certain facilities for some time to come. The subject is up for debate in the Chamber of Deputies. *Freights*—are easier, at 55/ for the United Kingdom, 60/ for the Continent and $15.50, less 5 %, for New York. *Coal*—is declining, and sold at 27/ @ 28/ for English. *Exchange*—fluctuates wildly declining from 33¼ to 31¼d. per dollar, and closing at 30½d., 90 days.

A New Testing Machine.

Richlé Bros., of Philadelphia, Pa., have introduced a new testing machine for applying transverse strains to metals and other materials. The illustration furnishes a correct representation of the apparatus, which is constructed of iron, steel and brass, with a wooden base. The specimen to be tested is shown in position under the lowest of the three levers, one end of it resting upon a A support, the other end being suspended from the lever by a suitable attachment. The strain upon the specimen is produced by turning the wheel shown in front. The graduated beam or lever shown on top is provided with a sliding poise, in order to regulate the strain. During the process of testing, the power must be applied simultaneously with the moving of the poise. The contrivance was first used to test cast iron for iron foundries, but is equally well adapted for testing other materials, such as wood, cement, alloys, &c. An apparatus of the following dimensions will weigh about 483 pounds, and is capable of testing specimens of from 12 to 36 inches up to 4000 pounds: Length, 5 feet; hight, 3 feet 5 inches; width, 1 foot 2 inches.



A NEW TESTING MACHINE.

Census Report on the Copper Industry.

Until the Chilian copper fields rose into importance, the world depended on Cornwall for this mineral. In 1842 some buffalo hunters discovered a rich mine in the Lake Superior region, which has yielded thousands of tons of copper. At present the world's production of copper is about as follows: Chili and Peru, 34,000 tons; United States, 25,500 tons; Australia, 14,500 tons; Russia, 5600 tons; England, 5200 tons; and all other countries, 19,000 tons, making an aggregate of 103,800 tons. The United States is the second copper producing country in the world, and the census of 1880 will show that we produced over 25,500 tons of copper, or, to be more exact, 51,091,188 pounds. This amount of copper would make a cube whose edge would be 45½ feet, or, in other words, would cover 25.9 acres with a sheet 1 inch thick. The copper product has increased, since the census of 1870, 116.41 per cent. in weight and 70.25 per cent. in value, the fall in price per pound, according to Prof. Pumpelly, being almost exactly accounted for by the rise in the value of the paper dollar. In 1870 the Lake Superior region produced 83 per cent. of the entire product; in 1880 it attained 89.71 per cent.

A curious fact, tending to show the increased skill in copper mining, and the extensive introduction of steam power and improved machinery, notably the drills driven by compressed air, is brought out by this inquiry. Though the product has increased 116 per cent., the number of employees has increased only 13.7 per cent., while the capital has increased 303 per cent., the horse-power of the steam engines 119 per cent., and the consumption of material 136.5 per cent. The gain in production per hand is 90 per cent. The same labor which in 1870 produced 4387 pounds of copper, now produces 8344 pounds.

The following carefully prepared table shows the copper product of the United States for 1880 in pounds of ingot copper, the value of the product, and the total number of persons employed in the industry:

	No. of mines.	Product in pounds.	Value of product.	Total No. of hands employed.
Michigan	19	45,830,262	$7,979,232	5,004
Maine	3	83,080	10,125	97
Maryland	1	164,640	1,200	6
Missouri	3	230,717	25,730	41
North Carolina	9	1,640,000	350,000	328
Pennsylvania	1	476,508	5,630	10
Tennessee	1	.....	.....	4
Vermont	1	4,247,804	469,425	619
Wisconsin	1	18,087	1,549	7
Total	32	62,932,871	$8,842,961	6,116

The production of the extreme Western States and Territories (Colorado, Arizona, Idaho and California), as far as received by the census office, is 5,764,460 pounds, or 11.28 per cent. of the amount produced in the Eastern districts. Eleven new mines in Maine, Maryland and New Hampshire, report the employment of 162 men, the payment of $31,995 wages and $7650 for material consumed. They have spent $658,470 for machinery, dead work, &c., but have produced no ingot copper. Returns from this class of mines are not included in the above table. The value of the plant in Michigan is placed at $5,275,185, and all copper mines in the United States at $5,824,825. The value of real estate, by which we mean the mine itself as a mineral producer, which value depends, of course, on the average price of copper during a term of years, and on the reasonable expectation of productive life for each mine, is placed at $24,116,500 in Michigan, and $24,517,146 for the entire country, and the total capital at $30,413,551 for Michigan and $31,675,096 for the United States. As compared with the iron ore mining industry, copper employs 80.53 per cent. less hands, uses 50.61 per cent. less value of material and represents 48.61 per cent. capital. The product of copper is worth 38.19 per cent. of the value of the iron ore mined, but it costs 39.92 per cent. as much in labor to raise it. The average monthly wages in copper mining is $49.98, against $32.26 in iron-ore mining; in addition to which the miner has the great advantage of more continuous employment. Copper mines involve the employment of skilled and high-priced labor.

Carbon in Steel.—Prof. Leeds has found that the amount of carbon in a piece of steel which had been purposely burned was the same as in a similar piece which had not been burned; the burning, however, was of the steel itself, which contained a large amount of the oxide of iron—that is, the metal instead of the carbon burned. The heat, he says, does not harm steel or iron, and consequently they may be heated and cooled an unlimited number of times, provided they are not brought in contact with the air and so take up oxygen. In heating a piece of steel the amount of blast has more to do with the burning than the heat; and if the extra amount of oxygen which a burnt piece of steel has taken up is taken out of it, it can be made to work just as well as it did before. The proof that the heat does not harm the steel is found in the fact that if the steel is put in a closed box, and luted up so as to keep out the air, it can be heated and cooled an unlimited number of times without injury.

Instead of using putty for glazing, an English inventor proposes to take a length or strip of thin hard metal or alloy curved in its width, which is fixed to any ordinary glazing bar in such a position that one edge of its convex surface shall press firmly and evenly on the surface of the glass. It will be found that by using thin hard metal curved and placed as above, on account of its springiness the glass will be held firmly without any undue pressure being exerted at any point, and that the metal will give and adapt itself to any unevenness in the glass. He can apply his invention to any ordinary description of glazing or sash bar, but in some cases where a special bar is used it would be found preferable to apply the metal lengths to both the upper and under surfaces of the glass. He employs one or more lengths or strips of curved metal, according to the length of the glazing or sash bar.

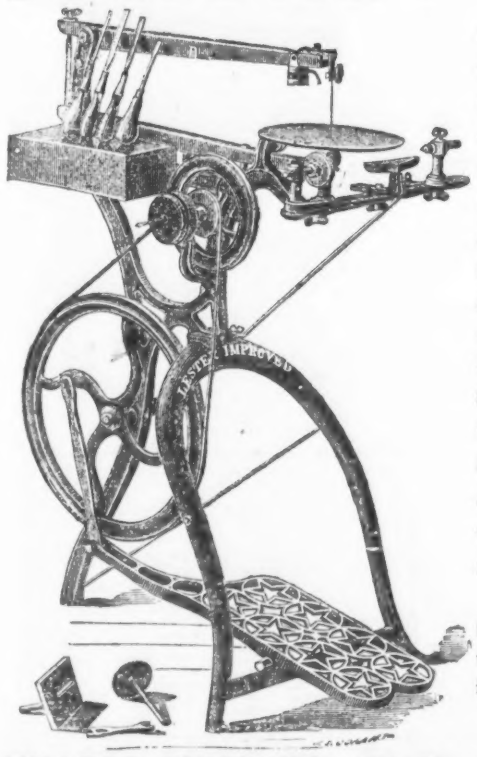
Statistics have just been issued from the French Ministry of Public Works showing the production of coal, iron and steel in the republic during the first half of 1881 and 1880, respectively. Of anthracite coal the out-turn was 9,125,851 tons to June 30 this year, against 9,736,913 tons last year, and of lignite, 265,382 tons this year, against 276,884 tons in the first six months of 1880. The following table exhibits the total production of coal, as well as of iron and steel in their various forms, in tons, during the period named in each of the two years:

	1881.	1880.
Coal	9,391,233	10,013,797
Pig Iron	931,742	885,767
Iron rails	15,138	18,310
Wrought iron	409,958	373,400
Sheet iron	74,846	73,278
Steel rails	148,596	144,920
Bar steel	49,803	48,200
Steel plates	11,812	9,233

Although the production of coal has fallen off to the extent of more than 6 per cent., there has been a considerable increase in that of iron and steel. Commenting on these returns, the *Debats* says that French ironmasters were never busier than they are at present, the execution of M. de Freycinet's scheme of public works assuring to them a plentiful supply of orders for a long time forward. From another source we learn also that the stocks of iron in the hands of merchants are very much reduced, and that a further advance in prices has been secured, the quotation in the Nord being £7. 4/ per ton for merchant iron. The average price last year was £6. 16/, and in 1879 only £6. 12/ per ton.

A considerable steel-making industry exists at the present day in China, on the Upper Yangtze, whence the steel is sent to Tientsin for shipment and distribution. It fetches much higher prices than the Swedish steel imported into the country. The Chinese metallurgists recognize three kinds of steel, namely: That which is produced by adding unwrought to wrought iron while the mass is subject to the action of fire, pure iron many times subjected to fire, and native steel, which is produced in the southwest. The different names for steel are *twan kang*, or ball steel, from its rounded form; *kwan kang*, or sprinkled steel; *wei tee*, or false steel. The Chinese have apparently known how to manufacture steel from the very earliest ages.

BRACKET SAWS



are now a staple article in all Hardware Stores. They make trade lively about Christmas time, when it would otherwise be dull. The demand is such that any dealer can sell a few if he has them in stock. During the past six years a great number of saws have been put on the market, of more or less merit, but at present the demand is almost wholly for the Lester and Rogers Saws. The Lester Saw with all of its attachments sells for $10.00, and the Rogers Saw for $3.50. These rates seem low, but we are able to sell at such prices Saws which give entire satisfaction, with no come-back on the Dealer.

We are also Headquarters for Saw Blades, Wood, Designs, and all things pertaining to the Bracket Sawing business.

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VARIETY IRON WORKS.



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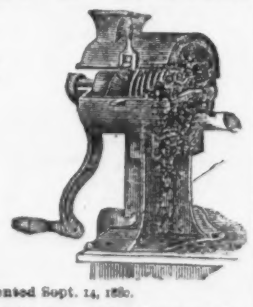
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Double Shearing Cut. Solid Cast Steel Blades.



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Easily worked. Easily cleaned. Will not get out of order. Ask your dealer for them.

Send a postal for Circular with testimonials.

Will send one as sample by express upon receipt of $2.00.

Kieser's No. 55



Are Made on the Same Principle as the Gem Meat Cutters,

But with capacity to cut 100 pounds Pork an hour.

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Our **No. 1 Butcher,** for hand or power, will cut 300 pounds an hour.

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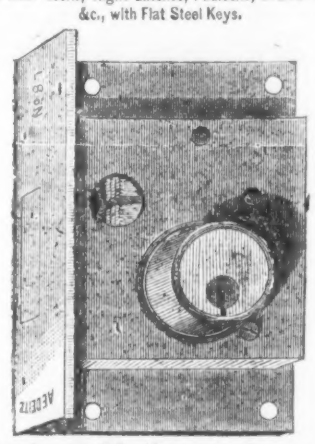
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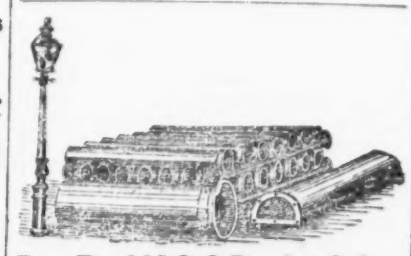
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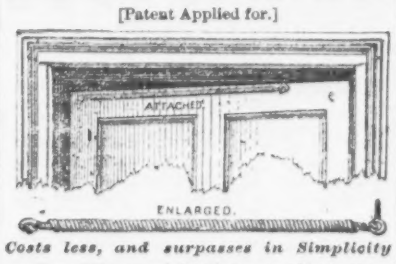
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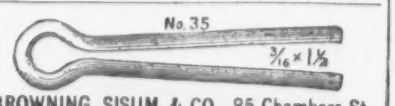
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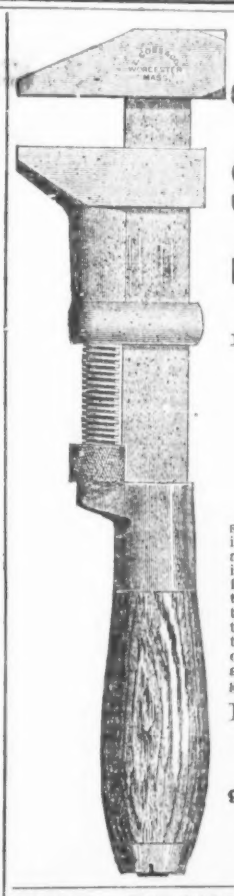
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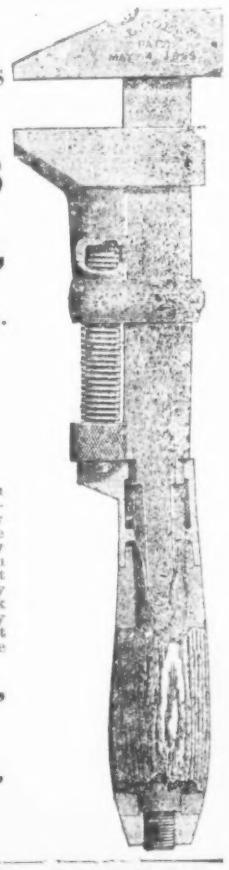
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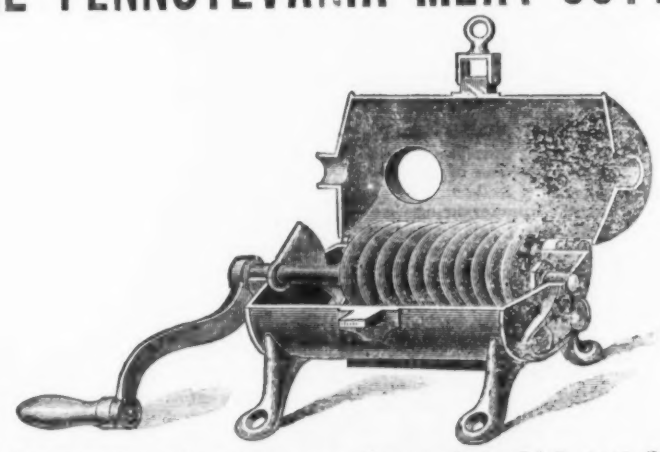


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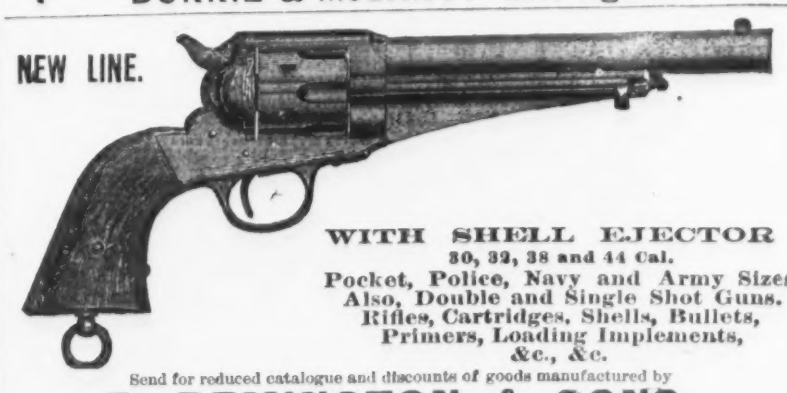
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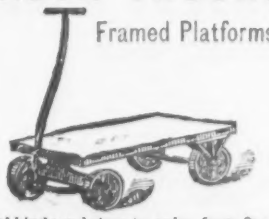
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NEW HAMPSHIRE.

The Dover Foundry and Machine Works, of Dover, are about to enlarge their machine shop so as to have increased facilities for turning out whole and split pulleys, shafting, hangers and couplings. The company are doing a large amount of work, and have recently filled a large order for Europe.

Geo. H. Whitney, Nashua, is building two 18-ton lathes for the Union Pacific Railroad.

MASSACHUSETTS.

Reed Bros., tack manufacturers, have made a claim against the town of Brockton for $5000, alleged damage to their mill privilege at East Bridgewater, claimed to have been occasioned by the building of the Brockton Water Works Reservoir.

Business at the glass factory, Sandwich, has not been so good for many years as at present. The glass makers are obliged to work the entire week to keep up with orders.

The Dighton Stove Lining Company are driving their works to their fullest capacity, and are running night and day to supply orders.

Messrs. C. H. Brown & Co., Fitchburg, have recently shipped a 250-horse-power engine to the United States Armory in Springfield.

RHODE ISLAND.

The Point Street Iron Works, at Providence, have been sold under a mortgage for $40,000

CONNECTICUT.

An extension, 34 x 100 feet, is being added to the Franklin E. Moore & Co. bolt shop, at Winsted, which will double the capacity of the establishment.

With nearly 700 men employed, the power of two large engines and the greatly extended area of shop room, the Pratt & Whitney Company's factory is obliged to refuse orders, and confine itself to selections for work. On one day last week 60 finished lathes were awaiting transportation; and 15 drop hammers with falling weight of from 400 to 1200 pounds, all one order, and nearly finished, with a number of others started, besides three screw-heading machines nearly finished, and weighing 8000 pounds each, and seven lathes, varying from 42 to 54 inches swing; seven large planers 40 inches square, and six planers of 30 inches square, &c., were among the products of this concern.—*Boston Commercial Bulletin.*

The William Rogers Manufacturing Company are now running on full time, with orders for this fall and winter, their business on the whole increasing over what it was last year.

The Hartford Engineering Company are building a pair of 300 horse-power engines for the Holyoke Water Power Company.

NEW YORK.

The Bessemer Steel works at Troy show an unexampled output. When the works were opened in the fall of 1865 three heats per day of five tons each was considered a fair day's production. Some years later, when the manufactured supply of steel reached 30 tons daily, greater success was not thought to be attainable; but while three heats a day was the maximum 24 years ago, successful inventions have reduced the average time per heat to 18 minutes. "Heat" is the term used to imply the changing of iron into steel in the converting vessels. A heat of five tons in three hours was considered good work some years ago. When the vessels were emptied of the steel they had to be laid aside to cool, and much time was lost. This has been obviated by false bottoms and other improvements, and now as fast as one heat is made another can be begun. The 15 tons which were made in 24 hours two decades ago can now be made in as many minutes. Recently the grand total for the 24 hours, including a stoppage of 30 minutes, was 575 tons. Three years ago the largest output in any day was about 300 tons. The superintendent of the works expects to make at least 3000 tons per week before Christmas. —*Boston Commercial Bulletin.*

The Globe Hardware Company, of New York city, has been placed in the hands of a receiver. The firm's liabilities are estimated at about $50,000, and assets at $10,000

NEW JERSEY.

A Paterson machine manufacturer, a few days ago, sent a marine engine to Alaska, and has just received orders for steam engines for Auckland, Australia, another for Bombay, and a third for South America.

There are now about 1200 hands employed in the eight glass factories now running at full blast at Schetterville.

The Magnetic Consolidated Iron Company are working their mines, known as the Hager and Duckworth, near Little York, Hunterdun County, with very gratifying results. Their daily output is quite large.

The Glen Gardner and Annandale iron companies have been very successful this year in the development of their mines, near Annandale. They have a considerable quantity of ore on the dump, and are now shipping regularly to the Lehigh furnaces.

PENNSYLVANIA.

A change has been made in the proprietorship of the L. B. Flanders Machine Works, taking effect Oct. 1. The new owners are H. C. Ayer, who has been in charge of the office department for the past six years, and D. W. Pedrick, who has been foreman of the machine shops ten years. The works are in a very prosperous condition, and the new owners will doubtless maintain the reputation which the works have enjoyed so long in the past.

The Wheatland Bessemer Steel Company have given the machinery of their works a trial, and it has been very satisfactory.

The additional improvements at the works of the Pottstown Iron Company consist of six double puddling furnaces and a number of new machines for the nail factory.

The Lyman-Haskell accelerating or multi-charge cannon, of which mention has been made in these columns, was successfully cast at the Scott Foundry, Reading, on Oct. 29.

The furnace of the Temple Iron Company, at Temple Station, Berks County, was put in blast on Monday, the 24th ult., after having been idle since the 5th of July. The furnace was thoroughly repaired, and an entire new lining was put in.

A limited partnership has been formed for the operation of the Redstone Works, above Uniontown, by J. W. Moore, J. M. Schoonmaker and Presley H. Moore, under the name and style of the Redstone Coke Company, Limited. The capital is placed at $30,000.

Preparations are making to blow in Dunbar Furnace No. 2, after which No. 1 will undergo repairs.

The employees of the Reading Hardware Company are working overtime three nights a week.

The Pennsylvania Railroad Company are having erected at Altoona new shops, the work in this connection going on night and day, electric lights being used for night illumination. The company have also sent to Harrisburg for men to lay the brickwork.

The Catasauqua Manufacturing Company have introduced eight electric lights of 2000 candle-power, and they work well.

The E. & G. Brooke Iron Company, of Birdsboro', are preparing to erect some new puddling furnaces. No. 1 Keystone Furnace of this company has recently gone into blast.

PITTSBURGH AND VICINITY.

The Chartiers Glass Company are adding another tank furnace to their works, and building a new packing room, 60 feet front, which, in addition to the former building, will make 125 feet front altogether. This will add greatly to the appearance of the structure. The fall trade with this house is reported to be exceedingly good. They have an office and sample rooms at 10 Wood street Pittsburgh.

A new train of rolls are being put in at the Pittsburgh Forge and Iron Works, Allegheny.

Messrs. Jones & Laughlins, of the American Iron Works, have put in a machine for turning out, automatically, car links ready for welding. The iron is taken heated from the furnace in the form of round rods, and with extreme rapidity drawn through the machine, which cuts, bevels and doubles the iron into link form, only requiring welding to be complete. Between 15,000 and 20,000 links can be turned out per day by this machine, which was devised and constructed at these works.

The frame building for the new bridge works at McKee's Rocks is going up rapidly.

Electric lamps enable the contractor to continue his work by night on the new Westinghouse Air Brake Works on Robinson street, Allegheny.

The firm of Messrs. Dilworth, Porter & Co. were slightly misrepresented in our last, in the statement that 519 kegs of spikes was the largest day's work ever done at their mill. This, of course, was erroneous; the 519 kegs were the product of four machines on the night turn, and were the largest amount ever turned out by that number of machines in that time. The largest day's work ever turned out by the works was 1335 kegs.

Agnew & Co., glass manufacturers, are doing well, and work at the factory at Hulton progresses briskly. They report trade good.

MARYLAND.

John T. Coleman & Sons, corner of Holiday and Pleasant streets, Baltimore, have just completed and set up three horizontal boilers, each with a capacity of 100 horse-power, for the Brush Electric Light Co., to be used by them for lighting the principal streets, parks, and public buildings of Baltimore. Each boiler is 72 inches diameter, 12 feet long and contains 125 3-inch tubes. They are at present building three, of the same size, for the Maryland Fertilizing Co., whose extensive works will be in running order by December. They are also at work on several others, to be used in the city by different parties. Boilers made at their works are extensively used in the South, and give general satisfaction. The works are the largest of the kind in Baltimore and are well worth a visit.

OHIO.

The Youngstown *News* says: Hannah Furnace was blown out yesterday morning after the cast, in order to make some necessary repairs and give it a thorough lining from bosh to top. The furnace was blown in for the first time on June 14, 1880, and has been doing excellent work ever since under the careful management of Furnaceman Thomas Pollock. It has been known to turn out 83 tons of mill pig in 24 hours.

The foundation for the new glass house above Tiltonville is about finished, and we learn the work of putting up the buildings will be pushed as rapidly as possible.—*Martin's Ferry Times.*

Owing to their increasing business, Arms, Bell & Co., of Youngstown, have put on a night crew, and are now running their rolling mills double turn.

The Cleveland Spring Works were destroyed by fire on October 30. Loss, about $16,000, fully covered by insurance.

The Corns Iron Company, of Girard, are running their rolling mill double turn, and have all the orders that they can handle. Two new puddling furnaces have recently been added to the works.

Wick, Arms & Co., Youngstown, are running full time, and turning out a large amount of spikes, nuts and rivets. Their trade is a large one, and only limited by their capacity for production.

David R. Spaulding, president of the Jefferson Iron Works, of Steubenville, and his son, Charles Spaulding, have disposed of their stock, amounting to 100 shares, for $126,632.50, to W. H. Wallace, C. B. Doty and John M. Clinton. Eight hundred thousand dollars is the capital stock of the works, and the company is in a prosperous condition. The Spauldings have large interests at other points, to which they will devote their attention hereafter.

The Peerless Door Spring Company is the name of a new concern which has been organized recently in Cincinnati. They manufacture, as leading hardware specialties, the "Japanese" spring butts—a new style, with a highly ornamental Berlin bronze finish; the "Cincinnati" spring hinge (new), finished in Berlin bronze or Japan. Besides these, they manufacture the "Torrey" rod springs, the "Torrey" coil springs (new), "Cincinnati" pin fasteners, and their "Peerless" door springs of various sizes. The company have just issued a very handsomely illustrated circular and price list, which they are now sending to the trade.

The Cincinnati Rolling Mill Company have recently added 40 more chain machines to the chain-making department of their works. They are now running 115 machines to their fullest capacity, and expect soon to run this number day and night; they are making chains of all sizes, from a very superior iron which they make in their own mills from select scrap. Since the commencement of the chain business by this company, they have filled some very large orders at Cincinnati and other cities in the West and South, and expect a very heavy business next year, in consequence of which they contemplate a still greater increase of machines in the near future.

The Morris Sash Lock Mfg. Co., of Cincinnati—a comparatively new concern, having been in operation about two years—have made rapid strides in the direction of new improvements in sash, door and shutter locks, and have recently taken out several patents upon articles of that class. Within the past year they have furnished heavy orders for sash locks for government buildings, besides filling some large orders from the trade. The company have for some time been contemplating the removal of their works to a more spacious building, in order to increase their capacity, and have recently decided to take a large building on Home street, where they will add new machinery and additional power to their finishing department, besides doubling the space in their molding department. Their catalogue for the current year shows a great variety of interesting hardware specialties.

WEST VIRGINIA.

Mr. G. S. McFadden hopes to light the fires in the rehabilitated rolling mill at Moundsville early next week.

ILLINOIS.

The Union Iron and Steel Company, of Chicago, are about to erect an addition to their works to cost $7000. It is to be used as a billet mill.

The Calumet Iron and Steel Company, of Irondale, are putting in new boilers, so that their nail factory will be entirely independent of their mill for a supply of steam. They received seven vessels loaded with iron for their blast furnace last week.

The Northwestern Boiler Works, of Chicago, are very busy.

The blast furnaces of Chicago are experiencing great inconvenience on account of the lack of coke. One of the Union Iron and Steel Company's stacks was compelled to shut down last week.

H. B. Scutt & Co., barbed-wire manufacturers, of Joliet, are placing in their works 10 more four-point wire-barb machines, and are employing 115 men on full time.

Shumway, Burgess & Co. have just completed the delivery of 200 tons of bolts for the Wabash Elevator, Chicago. They are adding a quantity of new and improved machinery to their works.

Five of the new nail machines lately constructed by the Northwestern Horse Nail Company are now in operation in their works.

IOWA.

The new frame molding room at the Union Iron Works, Clinton, is inclosed, and is being rapidly completed.

Part of the Iowa Barb Wire Company's works were destroyed by fire October 26th. The loss on buildings, machinery and stock is about $45,000, principally covered by insurance. It is not positively known what caused the fire, but it was probably ignited by a workman's lantern. As this company have a new two story building 200 feet long and saved their boilers and engines, they will be running within a few days. They were fortunate enough to have a number of new machines, and will consequently suffer little inconvenience.

MISSOURI.

Messrs. M. M. Buck & Co., of St. Louis, are building up a large trade for light locomotives.

The Missouri Stove Foundry Co. have been compelled to increase their working room, and have completed and occupied a new extension to their works.

The board of directors of the Excelsior Manufacturing Company have ordered a vote of the stockholders to be taken on December 19 next, to pass on the proposition to increase the capital stock of the company to $500,000.

MICHIGAN.

The following table from the Marquette *Mining Journal* exhibits, in gross tons, the total lake shipments of iron ore the present season, up to and including October 19, together with the amount shipped during the corresponding period last year:

Where from.	1880.	1881.
Escanaba	1,030,306	1,238,518
Marquette	579,827	621,518
L'Anse	48,670	48,872
Total	1,658,803	1,908,908

An increase of 250,105 gross tons.

Electric Head Lamp for Locomotives.—In March last the Austrian Prince Rudolphe Railway Company commenced a series of experiments on the use of electric lighting on locomotives. For this purpose a small steam engine and dynamo machine were mounted on the boiler; the lamp was movable, and could be turned in any direction by the engine driver. After a good many trials with different lamps, it was found that those on the Sedlaczek system gave the best results, the light remaining steady and unaffected by vibration. The road was perfectly illuminated for 500 yards ahead of the lamp.

The refrigerator erected a short time since at the Royal Victoria Docks by Messrs. I. & E. Hall, of Dartford, England, to the order of the directors of the London and St. Katherine Docks Co., has given entire satisfaction. The refrigerator was erected for the purpose of receiving the frozen meat imported from Australia, the freezing chamber and accessories having been fitted up by the engineer to the Docks Company. The company are said to be so well pleased with the results obtained, that they have ordered a second and larger refrigerator of Messrs. Hall, which will be constructed on a more recent, simpler and improved principle, and will shortly be in full operation. The consignment of meat brought over by the steamship Cuzco was frozen by one of the refrigerators of the original design of this firm, as made for a company in Australia. Two more machines, of a similar kind to those about to be used at the docks, are to be sent to the same Australian company. The Peninsular and Oriental and other companies are also adopting this system of refrigeration.

LABOR AND WAGES.

The strike of rolling mill employees in Cincinnati has at last ended. We clip the following from the Cincinnati *Commercial*, regarding the conference and settlement: "The strike of the rolling mill hands, some 2000 in number, which has been in progress since about the 1st of June, was brought to a comparatively amicable settlement about half-past 5 o'clock last evening. For five days the two committees wrestled over the question, and at noon yesterday it seemed that it was no nearer an end than it was on Friday night. At the afternoon meeting, however, the judgment of the conservative workmen seemed to have received that attention which was not accorded it in the previous part of the week, and the blind obstinacy of a portion of the workingmen's delegates yielded to the clear perception of the more intelligent element, who believed that the Cincinnati workman must conform to the iron industrial situation of the city, in order to place the same in a healthy competition with the general market of the country. The following agreement has been signed: 'We, the proprietors of the rolling mills in Cincinnati and vicinity, agree to pay the prices ruling immediately prior to June 1st last, provided the skilled workmen will agree to continue operations until the next card rate shall be established in Pittsburgh, and after the adoption of said card the same shall be the price in all our mills. The proprietors do further agree, in consideration of the acceptance of said Pittsburgh rate, to employ all labor about the mills and furnaces that is employed in Pittsburgh.' All departments of labor, except the plate and sheet mills, agreed to accept the proposition, and, after a short discussion, they, too, rather than prevent all their brothers from from receiving employment, agreed to close the matter finally. The proprietors conceded their demand for Pittsburgh rates at once, and the workmen agreed to accept it on June 1, 1882. Non-unionism was abandoned, but the proprietors were granted the privilege of employing and discharging such operatives as were suited to their wishes. All, it is hoped, will now move on smoothly, and one of our most important industries be placed in a condition of thrift and prosperity. The fires will be lighted early this week, and the condition of trade is such that all men competent for employment can be promptly engaged."

The window glass works of Schmeitz & Co., at Bellevernon, Pa., are idle on account of a strike for higher wages.

Several years ago bronze remains were dug up in the island of Funen, Denmark, but no one knew what had been their use. Lately Dr. H. Petersen was fortunate enough to find under the earth in Jutland what he stated to be a state carriage of the fourth or fifth century. It has ornamental woodwork. On the wheels were bronzes just the same as the ones discovered in Funen.



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THE PATENT SCREW
WINDOW BALANCE
was patented as follows: The "Balance Clamp," April 8, 1873; reissued Sept. 2, 1873. The "Adjusting Screw" application patented Jan. 5, 1875, and small minor, unimportant improvements were patented Nov. 6, 1877, this latter patent being the latest appended to my circulars, which the infringers below named have adopted, supposing that date to cover the invention in fact. The trade are cautioned against purchasing "Screw Balances" having a roller and clamp, as they are my inventions, fully covered by my patents above given, and all who handle or use these goods will be held for damages. An infringing Balance is now in the market, claimed to be made by the "Waverly Sash Balance Co." It is an exact copy of my Balance, as is also the circular, giving the date of Nov. 6, 1877, as the patent covering it. As this is my patent, though an unimportant one in the Balance patents, it is calculated to deceive honest dealers. These parties find my best prices, then offer, in a sly way, the same goods at less money, being at no expense to advertise or originally produce them, which cost me ten years' time and many thousands of dollars to perfect. They are only legitimately made by the undersigned, Inventor and Patentee of same to whom address all orders, &c.
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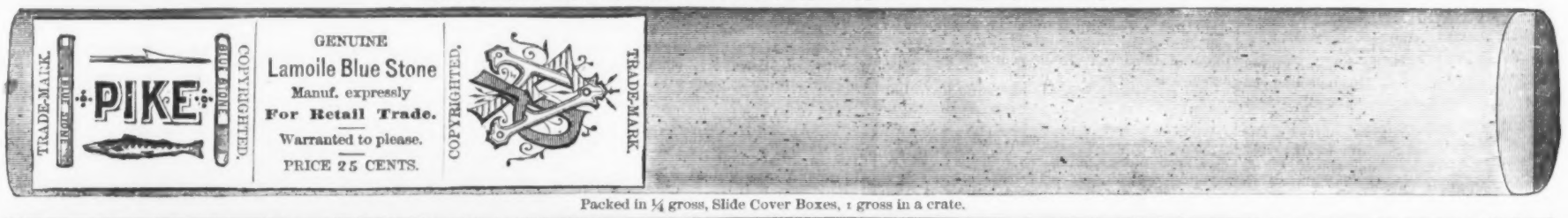


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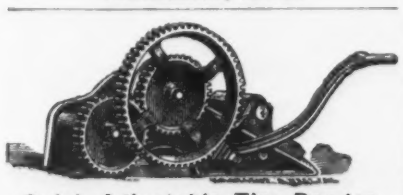
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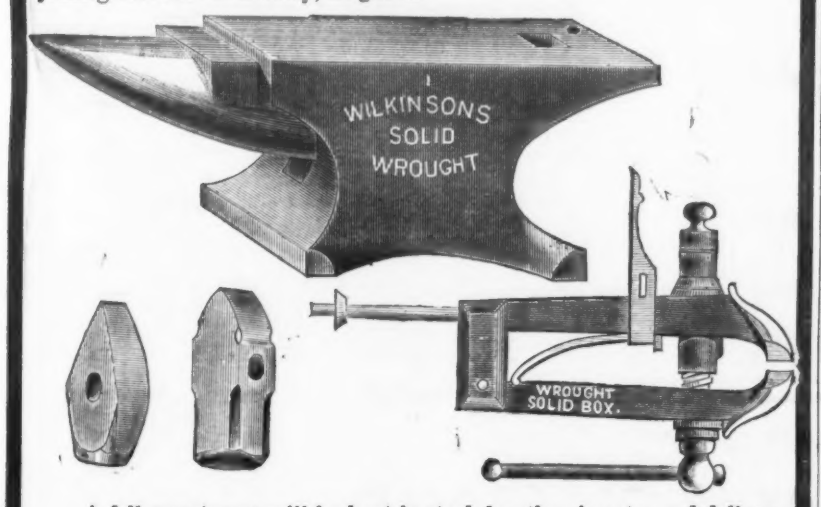
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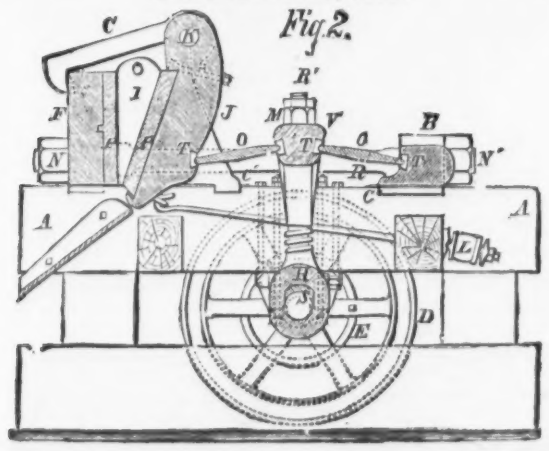
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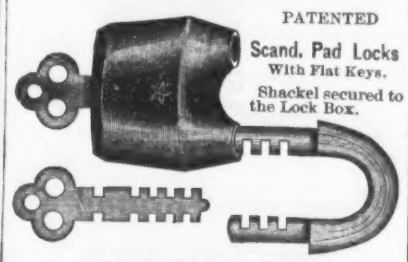
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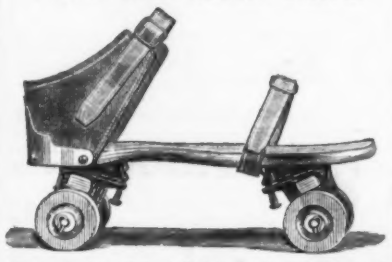
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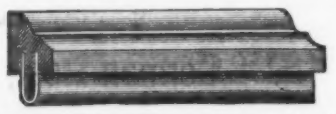
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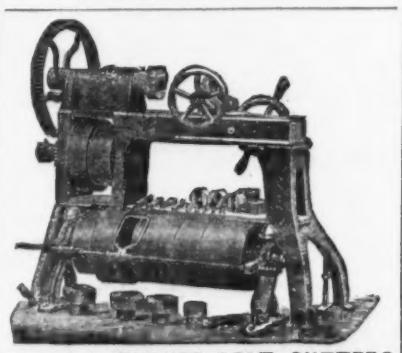
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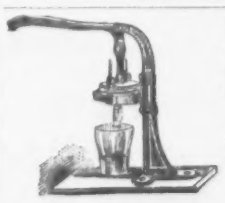
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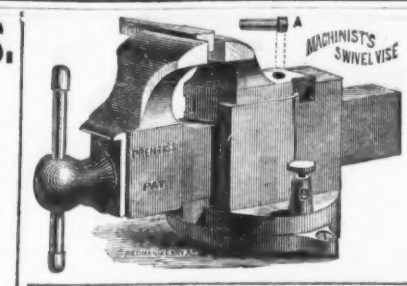
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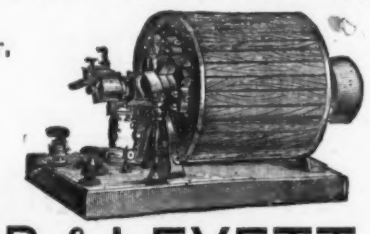
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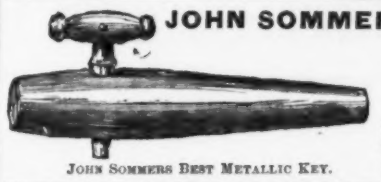
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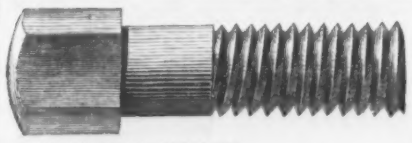
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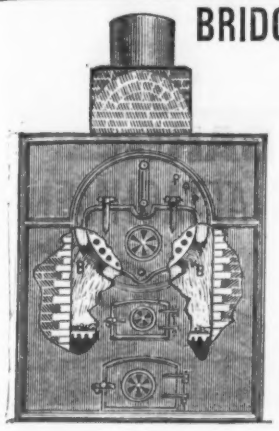
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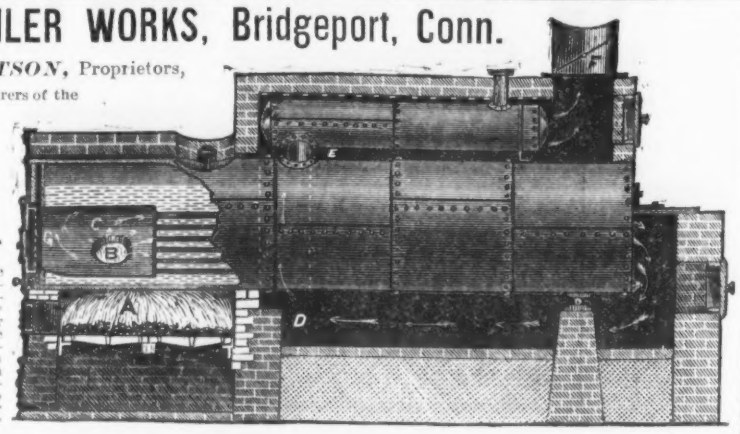
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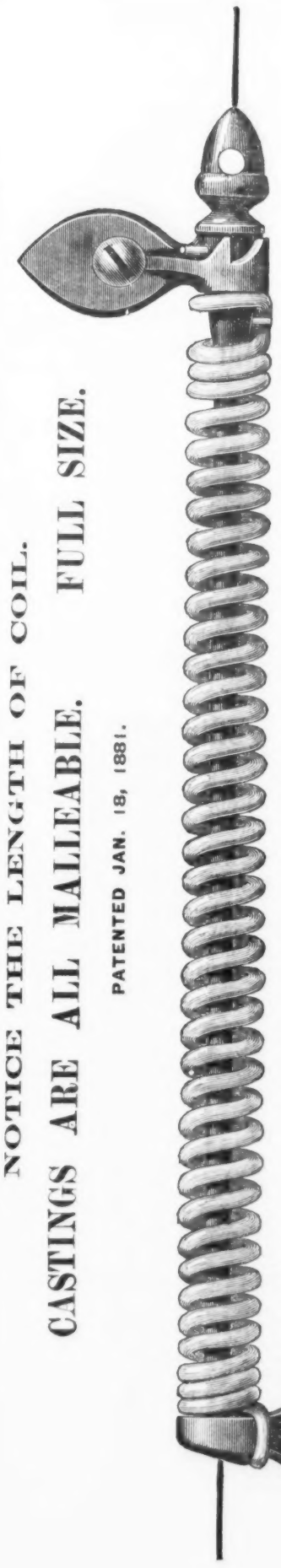
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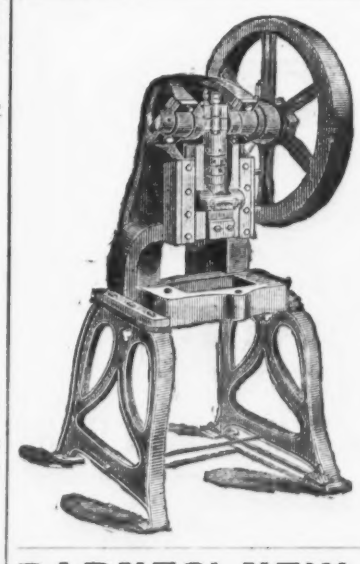


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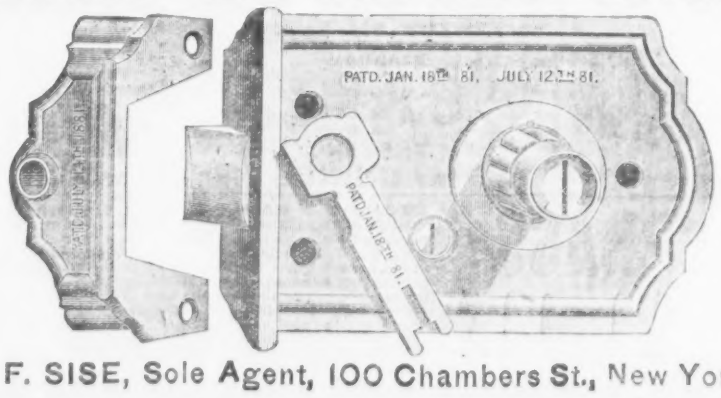
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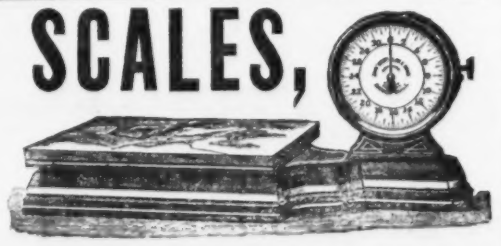
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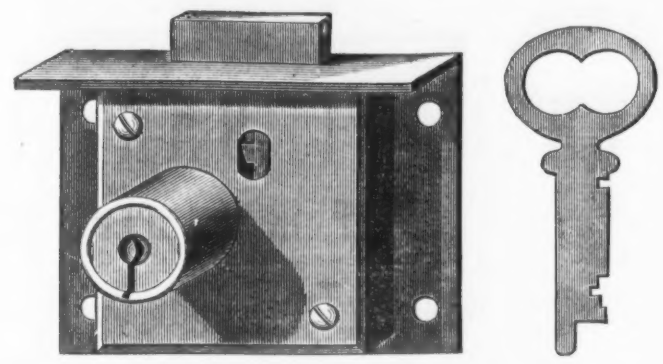
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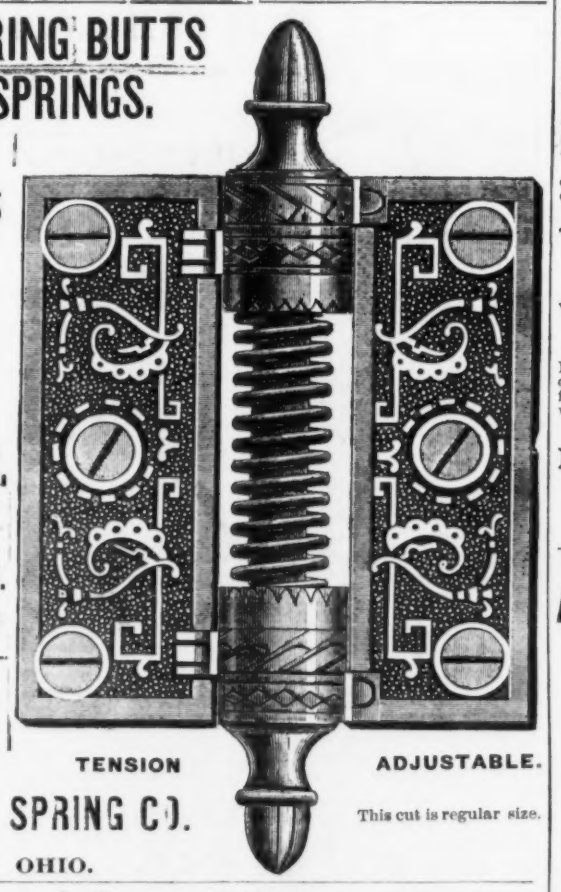
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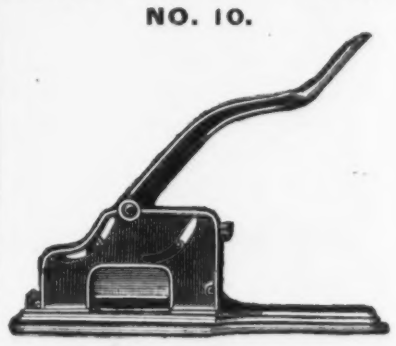
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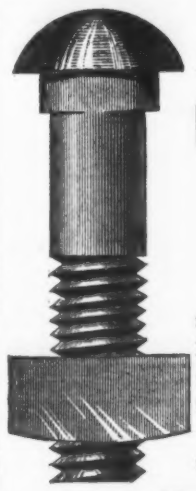
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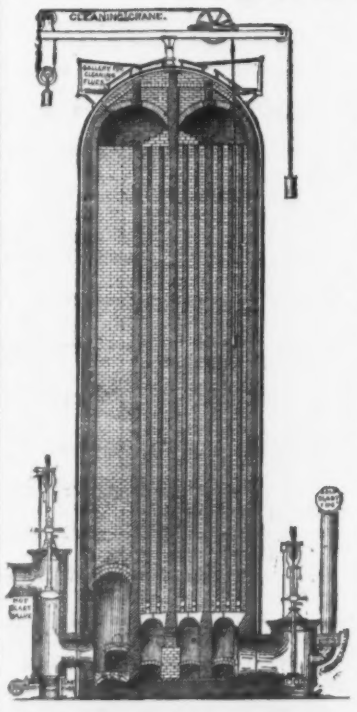
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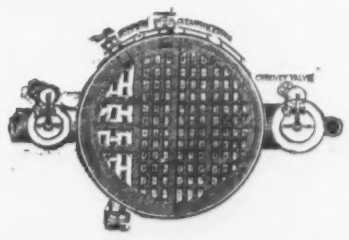


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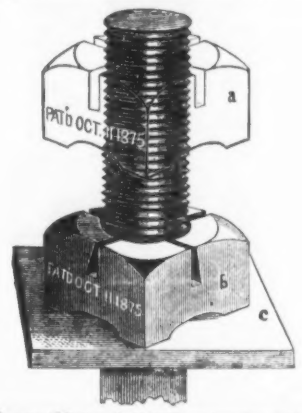
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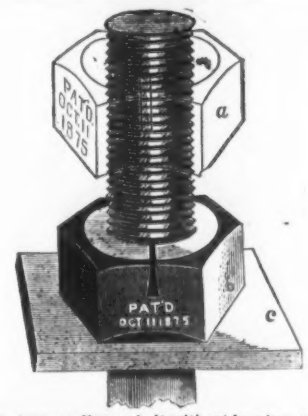
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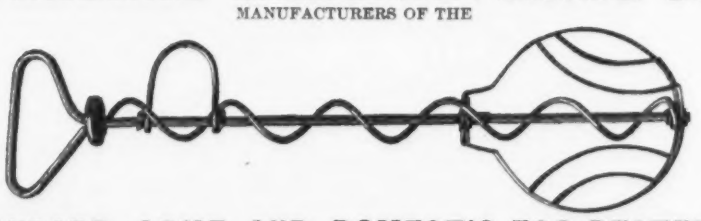
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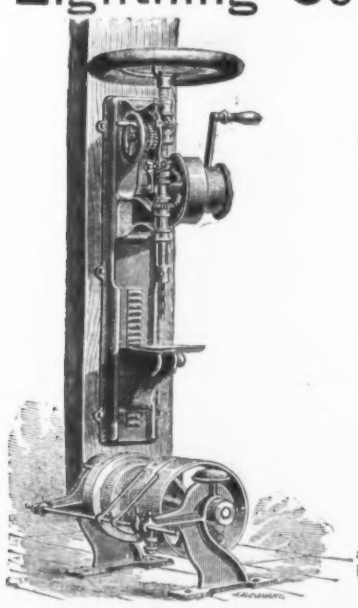
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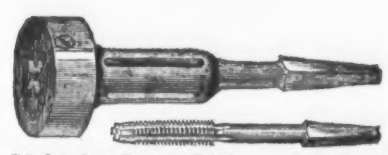
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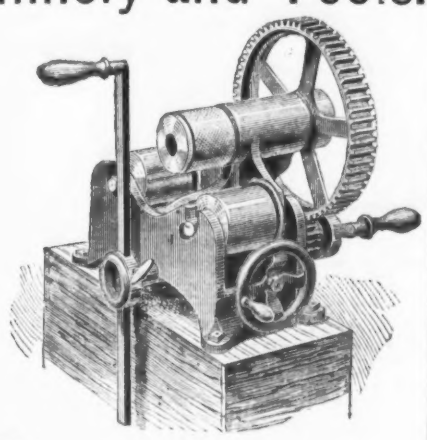
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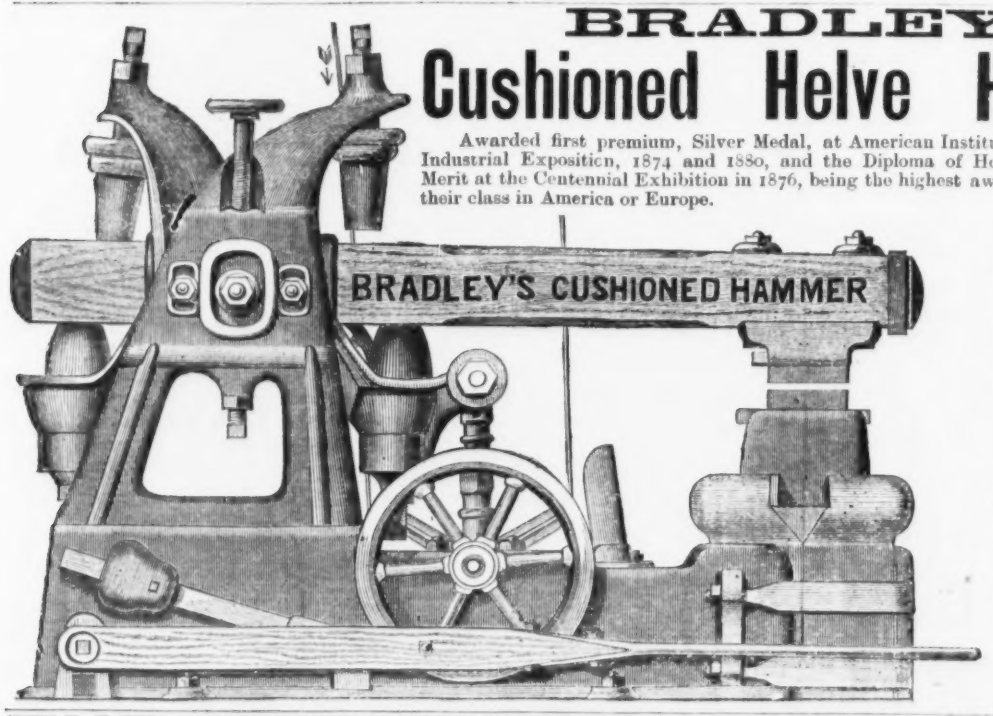
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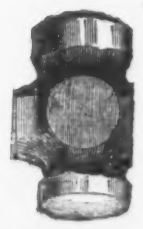
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(CUTS REDUCED FROM PLATES INDICATED.)



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Bridgeport Brass Co., Bridgeport Conn.....2
Brown & Bros., 81 Chambers, N. Y.....
Davol John & Sons, 100 John, N. Y.....2
Detroit Copper and Brass Rolling Mills, Detroit, Mich.....
Holmes, Booth & Haydens, 49 Chambers, N. Y..2&11
Merchant & Co., 507 Market st., Phila.....39
Plume & Atwood Mfg. Co., 18 Murray, N. Y.....2
Rome Iron Works, Rome, N. Y.....2
Scovill Mfg. Co., 421 Broome, N. Y.....2
Waterbury Brass Co., 206 Broadway, N. Y.....2

Brass Founders.
McFarland Wm., Trenton, N. J.....6
Reeves Paul S., Philadelphia.....50

Brass Wire Cloth.
Howard & Morse, 45 Fulton, N. Y.....2

Bridge Builders.
Moseley Iron Bridge and Roof Co., 5 Dey, N. Y 4

Butcher and Shoe Knives, *Manufacturers of.*
Wilson John, Sheffield, England.....18

Butts and Hinges.
American Spiral Spring Butt Co., 82 Beekman, N. Y.50
New England Butt Co., 99 Chambers, N. Y.....39
Sabin Mfg. Co., Montpelier, Vt.....37
Stanley Works, New Britain, Conn.....37
Union Mfg. Co., 96 Chambers, N. Y. 7

Carriage Bolts, *Makers of.*
Columbus Bolt Works, Columbus, O.....47
Haslett F. M. & Co., Allegheny, Pa.....47
Shelton & Co., Birmingham, Ct.....33
Townsend, Wilson & Hubbard, Philadelphia.....47

Carriage Hardware, *Makers of.*
Smith H. D. & Co., Plantsville, Conn.....13
The E. D. Clapp Mfg. Co., Auburn, N. Y.....8

Carriage Springs.
Dexter Spring Co., Hulton Pa.....29

Car Axles.
Roberts A. & P. & Co., 265 S. 4th, Philadelphia..... 5

Casters.
Phœnix Caster Co., Indianapolis, Ind.....18

Castings, Iron.
Cheney S. & Son, Manlius, N. Y.....4
Devlin Thos. & Co., Philadelphia, Pa.....34
Elwell Hardware Co., Bridgeport, Conn.....
Hammer & Co., Branford, Conn.....28
Queen City Malleable Iron Co., Cincinnati, O.....29

Castings, Steel.
Chester Steel Castings Co., 407 Library, Phila., Pa. 50
Eureka Cast Steel Co., Chester, Pa.....50
Flagg Stanley G. & Co., Philadelphia.....50
Pittsburgh Steel Casting Co., Pittsburgh, Pa.....50

Chains, *Manufacturers of*
Bradlee & Co., 816 Richmond St., Phila., Pa..... 5
Miller Chain Co., Akron, O.....34
Woodhouse S., Newburg, Ohio.....39

Chains, Sash.
Morton Thomas, 61 Elizabeth, N. Y.....44

Chisels, *Manufacturers of.*
Buck Bros., Millbury, Mass.....7

Clock Springs, &c.
Cary & Moen, 234 W. 29th, N. Y.....3
Dunbar Bros., Bristol, Conn.....7

Coal, *Miners of.*
Pardee A. & Co., 111 Broadway, N. Y.....42

Coal Hods and Vases.
Esterbrook Wm., Philadelphia, Pa.....37
Jewett John C. & Sons, Buffalo, N. Y.....
Griffiths Geo., Phila. Pa.....36
New York Stamping Co., 511 Ave. A, N. Y.....29
Pierce Geo. N., Buffalo, N. Y.....

Coffee and Spice Mills.
Lane Brothers, Millbrook, N. Y.....
Enterprise Mfg. Co., Philadelphia, Pa.....39

Coke.
Wister Francis, 230 S. Third, Phila.....5

Compasses and Dividers, *Manufacturers of.*
Bemis & Call Hdw. & Tool Co., Springfield, Mass..37&40
Stevens J. & Co., Chicopee Falls, Mass.....33

Copper.
Merchant & Co., 507 Market st., Phila.....39
Pope, Cole & Co., Baltimore, Md.....3
Pope Thos. J. & Bro., 292 Pearl, N. Y.....6

Cordage.
Elizabethport Steam Cordage Co., 48 South, N. Y..39

Corners for Oil Cloths.
Hubbell R., Northville, N. Y.....28

Corn Huskers.
Chambers, Bering & Quinlan, Decatur, Ill.....12

Corn Poppers.
Bromwell Mfg. Co., Cincinnati, O.....31

Corrugated Iron.
Moseley Iron Bridge and Roof Co., 5 Dey, N. Y. ... 4

Cotters and Cotter Keys.
Browning, Sisum & Co., 85 Chambers, N. Y.....27

Crayons, Metal Workers'.
Steward D. M., Cincinnati, Ohio.....47

Crucibles.
Seidel R. B., Philadelphia, Pa.....45
Taunton Crucible Co., Taunton, Mass.....11

Cupolas.
Smith & Sayre Mfg. Co., 245 Broadway, N. Y. 49

Cutlery, *Importers of.*
Boker Hermann & Co., 101 Duane, N. Y.....40&45
Bradford & Anthony, Boston, Mass.....11&22
Clatworthy F. & W., 82 Chambers, N. Y.....18
Field Alfred & Co., 93 Chambers, N. Y.....18
Friedmann & Lauterjung, 91 Chambers, N. Y 18
Gifford Mfg. Co., Union City, Conn.....

Cutlery, *Manufacturers of.*
Conway T. G., 90 Chambers, N. Y.....19
Furness, Bannister & Co., Newark, N. J.....18
John Russell Cutlery Co., 24 Chambers, N. Y 50
The Jamison & Goodnow Mfg. Co., 88 Chambers, N. Y.....18

Deoxidized Bronze.
Philadelphia Smelting Co., Ld., Philadelphia, Pa..21

Differential Pulley Blocks.
Yale Lock Mfg. Co., 53 Chambers, N. Y 3

Dog Collars.
Medford Fancy Goods Co., 96 Duane, N. Y 13

Discount Tables.
Jennings S. H., Deep River, Conn.....22
Leigh E. B., St. Louis, Mo.....13
Pope & Stevens, 114 Chambers, N. Y.....18

Dinner Pail and Lantern.
Haight Joseph, Fort Chester, N. Y.....28

Door Bolts.
Ives Hobart B., New Haven, Ct.....50

Door and Gate Springs.
Bartlett Frederick, Freeport, Ills.....43
Mohr, J. A. & Co., Manchester, Iowa.....31
Peerless Door Spring Co., Cincinnati, O.....32
Roebuck S. & Co., 164 Fulton, N. Y.....11
Butler Door Spring Co., Cleveland, O.....12
Van Wagoner & Williams, 82 Beekman, N. Y.....50

Drilling Machines, *Makers of.*
Sellers Wm. & Co., Phila. and 79 Liberty st., N.Y.49
Thorne, De Haven & Co., Philadelphia.....45
Wiley & Russell Mfg. Co., Greenfield, Mass.....34

Eave Trough Hangers.
Heartley & Demsey, Toledo, Ohio.....40

Edge Tools, *Makers of.*
Doscher M., 85 Chambers, N. Y.....40

Egg Beaters.
Standard Manufacturing Co., Boston, Mass.....33

Electric Light.
Fuller Electrical Co., 44 E. 14th, N. Y.....16

Elevators, *Makers of.*
Crane Bros. Mfg. Co., Chicago, Ill.....48
Stokes & Parrish, Philadelphia.....48

Elevator Buckets.
Rowland T. F., Brooklyn, N. Y.....9

Emery and Emery Wheels.
Irvine, Towne & Co., 123 Chambers, N. Y 31
Lehigh Valley Emery Wheel Co., Weissport, Pa.....50
Rogers J. F. & Co., 107 Liberty, N. Y.....49
Walpole Emery Mills, Boston, Mass.....30

Engineers' Supplies.
Bowers W. H. H., Salt Lake City, Utah.....49
Rogers J. F. & Co., 107 Liberty, N. Y.....49

Engines, Gas.
Schleicher, Schumm & Co., Philadelphia.....

Engines, Locomotive.
Baldwin Locomotive Works, Philadelphia, Pa..... 6

Engines, Steam, *Makers of.*
Cox & Sons, Philadelphia, Pa.....49
Davis A. J. & Co., Newark, N. J .....
Ervien Chas. W. & Co., Philadelphia, Pa.....49
Hartford Engineering Co., Hartford, Conn.....48&49
La France Fire Engine Co., Elmira, N. Y.....49
Lane & Bodley Co., Cincinnati, O 49
New England Mach'y Depot, 308 N. 3d, Phila.....29
Southwark Foundry & Machine Co., Philadelphia.49
The Norwalk Iron Works Co., S. Norwalk, Conn..48
Twiss Nelson W., New Haven, Conn.....48
Wetherill Robt. & Co., Chester, Pa.....49

Facings, Foundry.
Paxson J. W. & Co., 514 Beech, Phila.....
Whitehead Bros., 517 W. 14th, N. Y.....3

Faucets, *Makers of.*
Bohren U. & Co., 259 W. 27th, N. Y.....6
McNab & Harlin Mfg. Co., 30 Gold, N. Y.....47
Sommer's John, Son, Newark, N. J.....30

Faucets, *Self-Measuring, Makers of.*
Enterprise Mfg. Co., of Pa., Phila. and N. Y.....39
Lane Bros., Millbrook, N. Y.....8

Fencing, &c.
Cleveland Wrought Iron Fence Wks., Cleveland, O.11

Files, *Importers of.*
Field Alfred & Co. 93 Chambers, N. Y.....18
Carr J. & Riley 30 Gold, N. Y.....42

Files, *Manufacturers of.*
Auburn File Works, 89 Chambers, N. Y.....8
Barnett G. & H., 41 and 43 Richmond, Phila.....8
Boynton E. M., 80 Beekman, N. Y.....50
Disston Henry & Sons, Phila.....44
Everhart James M., Scranton, Pa.....50
Henssler Christian, Philadelphia, Pa.....8
Johnson & Bro., 1 Commercial, Newark, N. J.....8
McCaffrey & Bro., 1742 and 1744 N. 4th, Phila.....8
New American File Co., Pawtucket, R. I.....16
Nicholson File Co., Providence, R. I.....8
Paul Chas. B., Williamsburgh, N. Y.....
Spencer & John, Sheffield, England.....18
The J. Barton Smith Co., Philadelphia, Pa.....8
Union File Works, Baltimore, Md.....

Filters.
Jewett John C. & Sons, Buffalo, N. Y.....

Fire Brick, *Makers of.*
Borgner & O'Brien, Philadelphia, Pa.....44
Colson Chas. D., Chicago, Ill.....44
Gardner Brothers, Pittsburgh, Pa.....44
Hall & Sons, Buffalo, N. Y.....44
Kreischer B. & Sons, foot of E. Houston St.....44
Laclede Fire Brick Mfg. Co., St. Louis, Mo 44
Maurer Henry, 418 East 2nd, N. Y.....44
Miller S. P. & Son, Philadelphia, Pa.....44
Newton & Co., Albany, N. Y.....44
Ostrander James & Son, Troy, N. Y.....44
Rimington S. A., 40 and 42 Broadway, N. Y.....44
Union Mining Co., Philadelphia, Pa.....44
Valentine M. D. & Bro., Woodbridge, N. J.....44
Watson Fire Brick Co., Perth Amboy, N. J.....44

Flint and Emery Paper and Cloth.
Baeder, Adamson & Co., 730 Market, Phila.....29

Forges, Portable, &c.
Buffalo Forge Co., Buffalo, N. Y.....50
Cooke & Co., Cortlandt, N. Y.....49
Forge Company, Brooklyn, E. D., N. Y.....47
Holt Mfg. Co., Cleveland, O.....47
Keystone Portable Forge Co., 218 Carter, Phil.....37

Forgings, Iron and Steel.
Hubbard Charles, 46 Cliff, N. Y.....6
Rose Wm., & Bros., West Philadelphia, Pa.....6

Foundry Supplies.
Emerick J. A. & Co., Philadelphia, Pa.....3

Furnaces, *Makers of.*
Richmond & Potts, 119 S. 4th, Phila., Pa..... 5

Furnace Hoists.
Stokes & Parrish, Philada., Pa.....48

Furnace Shields.
McDonald H., Pittsburgh, Pa.....46

Furniture Springs.
Carr & Moen, 234 W. 29th, N. Y.....3

Garden Tools.
Dunlap C. W. & Co., 43 Chambers, N. Y.....32

Granite Iron Ware.
St. Louis Stamping Co., St. Louis, Mo.....19

Grate Bars.
Creswell David S., Philadelphia, Pa.....47

Grindstones.
Atkinson R. & Co., Newcastle-on-Tyne, Eng.....
Atlantic Stone Co., Boston, Mass.....31
Lombard & Co., Boston, Mass.....31
McDermott & Berea Stone Co., Cleveland, O.....31
Ohio Grindstone Co., Cleveland, O.....29
Wood Walter R., 283 and 285 Front, N. Y.....31

Gunpowder, *Makers of.*
Laflin & Rand Powder Co. 29 Murray, N. Y.....37

Hammers.
Hartford Hammer Co., Hartford, Ct.....34
Newlin & Yardley, Philadelphia.....30

Handles, Spokes, &c.
Hundley & Banks, 79 Reade, N. Y.....36

Hangers, Barn Door.
Kidder Slide Door Hanger Co., Romeo, Mich.....31
Moore S. H. & E. Y., Chicago, Ill.....39

Hardware Commission Merchants.
Brower & Leeds, 81 Murray, N. Y.....12
Field Alfred & Co., 93 Chambers, N. Y.....18
Graham & Haines, 113 Chambers, N. Y.....8
Heaton & Denckla Hdw. Co., 507 Commerce, Phila..27
Hymes David & Co., 62 Church, N. Y.....12
Siedel J., Habana, Cuba.....22

Hardware Dealers.
Lloyd, Supplee & Walton, 625 Market, Phila.....27
Shepard Sidney & Co., Buffalo N. Y.....45
Witte Francis T., 111 Chambers, N. Y.....18

Hardware Importers.
Boker Hermann & Co., 101 Duane, N. Y.....40&45
Field Alfred & Co., 93 Chambers, N. Y.....18
McCoy & Sanders, 132 Duane, N. Y.....18

Hardware Manufacturers.
Enterprise Mfg. Co., Phila.....39
Farrington J. B. & Co., 37 Warren, N. Y.....18
Flagler, Forsyth & Bradley, 298 Broadway, N. Y....33
Globe Mfg. Co., Middletown, Conn.....30
Jennings C. E. & Co., 90 Chambers, N. Y.....39
Lloyd, Supplee & Walton, 625 Market St., Phila., Pa.27
Miller's Falls Co., 74 Chambers, N. Y.....27
Russell & Erwin Mfg. Co., 45 Chambers, N. Y.....10
Shepard Hardware Co., Buffalo, N. Y.....39
Stanley Works, New Britain, Conn.....27
Tiebout W. & J., 93 Chambers, N. Y.....13
Trenton Lock & Hardware Co., Trenton, N. J.....27
Union Mfg. Co., 99 Chambers, N. Y.....7
Van Wagoner & Williams, 82 Beekman, N. Y.....50

Hardware Specialties.
American Machine Co., 128 Chambers, N. Y.....16
Cleveland Wrought Iron Fence Works, Cleveland, O.11
Davis Wm. L., Chelsea, Mass.....44
Kyser & Rex, Philadelphia, Pa.....27
Philadelphia Novelty Mfg. Co., Philadelphia, Pa. .11
Shepard Sidney & Co., Buffalo, N. Y.....45
Spencer & Underhill, 94 Chambers, N. Y.....13
Tower John J., 96 Chambers, N. Y.....13
Wollensak J. F., Chicago, Ill.....49

Harness Snaps.
Covert Mfg. Co. West Troy, N. Y.....20
Globe Mfg. Co., Middletown, Conn.....30

Hay Knives.
Holt Hiram & Co., East Wilton, Me.....47

Heater and Purifier, Feed Water.
Lowe & Watson, Bridgeport, Conn.....31

Heel Stiffeners.
Lyon Nelson, Albany, N. Y.....37

Hinges.
Stanley Works, New Britain, Conn.....37

Hoes.
Bruce George W., 1 Platt, N. Y.....18

Hog Ringers.
Chambers, Bering & Quinlan, Decatur, Ill.....12
Hill H. W. & Co., Decatur, Ills.....

Hoisting Engines, *Makers of.*
Crane Bros., Mfg. Co., Chicago, Ill.....48
The Norwalk Iron Works Co., S. Norwalk, Conn..48

Hoisting Machines.
Box Alfred & Co., 312 Green, Phila.....49
Dunn J., Cleveland, O.....49
Harrington Edwin & Son, Philadelphia, Pa.....49
Sellers Wm. & Co., Phila. and 79 Liberty st., N. Y. 49
Stokes & Parrish, Philada., Pa.....48
Yale Lock Co., 53 Chambers, N. Y.....3

Hooks (Cotton & Bale.)
New York Handle & Mallet Works, 456 E. Houston..13

Horse Clippers.
Boker Hermann & Co., 101 & 103 Duane, N. Y...40&45
Clark W., London, England.....18
McCoy & Sanders, 132 Duane, N. Y.....18
Shannon J. J., Philadelphia, Pa.....18

Horse Hay Forks.
Phila. Novelty Mfg. Co., 821 Cherry, Philadelphia..11
Waldron John, Muncy, Pa.....37

Horse Nails, *Makers of.*
Bridgewater Iron Co., Bridgewater, Mass.....7
Essex Horse Nail Co., Troy, N. Y.....9
H P Nail Co., Cleveland, O.....40
National Horse Nail Co., Vergennes, Vt 27
Saranac Horse Nail Co., Plattsburg, N. Y.....12

Horse Shoes, *Makers of.*
Chicago Steel Horse Shoe Co., Chicago, Ill.....16
Combination Iron Clad Steel Horse Shoe Co., Boston, Mass.....11
Keystone Horse Shoe Co., Philadelphia, Pa.....
Rhode Island Horse Shoe Co., Providence, R. I.....30
Schoenberger & Co., Pittsburgh, Pa.....4
The Burden Iron Co., Troy, N. Y.....4

Hot Blast Stoves.
Witherow & Gordon, Pittsburgh, Pa.....33

Hydrants, &c.
McLean John, 300 Monroe, N. Y.....47
Mohawk & Hudson Mfg. Co., Waterford, N. Y.....47

Hydraulic Jacks.
Dudgeon Richard, 24 Columbia, N. Y.....13
Lyon E. & Co., 470B Grand, N. Y.....49

Ice Cream Freezers.
Roebuck S. & Co., 164 Fulton, N. Y.....11
White Mountain Freezer Co., Laconia, N. H.....8

Ice Creepers.
Scott R. P. & Co., Newark, N. J.....37

Injectors.
Jenks James, Detroit, Mich.....46

Insurance, Boiler.
Hartford Steam Boiler Inspection & Insurance Co..16

Insurance, Life.
The Travelers' Life and Accident Insurance Co., Hartford, Conn.....33

Iron. (*Manufacturers' Agents.*)
Cox, Jr., Justice & Co., 333 Walnut, Phila.....
Hoffman J. W. & Co., 208 S. 4th, Phila.....
Lewis Safety & Co., Philadelphia, Pa.....
Lundell Chas. G. (Swedish), Boston, Mass.....6

Iron. *Manufacturers of.*
Albany & Rensselaer Iron & Steel Co., Troy, N. Y..42
Allentown Rolling Mill Co., Allentown, Pa.....
Birmingham Rolling Mill Co., Louisville, Ky.....
Britton Iron and Steel Co., Cleveland, Ohio.....6
Burden Iron Company, Troy, N. Y.....4
Carnegie Bros. & Co., Limited, Pittsburgh, Pa.....43
Elba Iron and Bolt Co., Limited, Pittsburgh, Pa...33
Keystone Rolling Mill, Limited, Pittsburgh, Pa...4
Kirkpatrick & Co., Pittsburgh Pa.....4
Leonard John, 450 West St., N. Y.....4
Montour Iron & Steel Co., Danville, Pa.....43
North Chicago Rolling Mill Co., Chicago, Ill.....43
Phœnix Iron Co., 410 Walnut, Philadelphia .....
Roane Iron Co., Chattanooga, Tenn.....5
Rome Merchant Iron Mills, Rome, N. Y 4
Rowland James & Co., 920 N. Delaware ave., Phila. 5
Rowland Wm. & Harvey, Philadelphia 50
Shoenberger & Co., Pittsburgh, Pa.....4
The Passaic Rolling Mill Co., Paterson, N. J.....4
Ulster Iron Works, 99 Broadway, N. Y.....
Wood Alan & Co., Arch, Philadelphia.....5
Zug & Co. Pittsburgh, Pa.....4

Iron Brokers.
Boynton Geo. A., 70 Wall, N. Y.....6
Etting Edward J., Philadelphia, Pa.....5
Fox & Drummond, 68 Wall, N. Y.....4
Gaillaudet P. W. & Co., Broadway and Wall, N. Y. 6

Iron, Charcoal, *Warm or Cold Blast.*
Lundell Chas. G. (Swedish), Boston, Mass.....6
Quincy John W. & Co., 98 William, N. Y.....4

Iron Commission Merchants.
Bailey J. F. & Co., 52 Wall, N. Y.....5
Field Alfred & Co., 93 Chambers, N. Y.....10
Heberton & Co., Philadelphia.....5
Hernsheim L., 105 John, N. Y.....6
Lundell Chas. G., Boston, Mass.....6
Mohr J. A. & Co., 420 Walnut, Philadelphia.....5
Richardson J. O., 228 Dock, Philadelphia.....5
Wister L. & R., 230 South Fourth, Philadelphia.....5

Iron Dealers.
Abeel Brothers, 100 South, N. Y.....4
Adams Hugh W. & Co., 56 Pine, N. Y.....4
Bonnell, Botsford & Co., Youngstown, O.....4
Borden & Lovell, 70 and 71 West, N. Y.....4
Carmichael & Emmens, 130 and 132 Cedar, N. Y.....4
Cooney Daniel F., 88 Washington, N. Y.....4
Cox Justice, Jr., & Co., Philadelphia, Pa.....5
Eagnshaw Alfred, Philadelphia, Pa.....5
Eglesston Bros & Co., 160 South, N. Y.....4
Harrison & Gilloon, 558 to 562 Water, N. Y.....4
Hoffman J. W. & Co., 208 S. Fourth, Philadelphia. 4
Hubbard Chas., 46 Cliff, N. Y.....4
Judson B. F., 457 and 459 Water, N. Y.....4
Kane C., Pittsburgh, Pa.....4
Lissberger S. A., 529 E. 10th, N. Y.....4
Lundberg Gustaf, 98 Kilby, Boston, Mass.....4
Lundell Chas. G. (Swedish), Boston, Mass.....6
Middleton W. S., 52 John, N. Y.....6
Naylor & Co., 99 John, N. Y.....42
Ogden & Wallace, 85, 87, 89 and 91 Elm, N. Y.....4
Pierson & Co., 24 Broadway, N. Y.....4
Pullman J. Wesley, Philadelphia, Pa.....5
Quincy John W & Co., 98 William, N. Y.....4
Reynolds, Carter & Reynolds, London, England...43
Richards D. W. & Co., 92 Mangin, N. Y.....4
Shimer & Co., Philadelphia, Pa.....5
Wallace Wm. H. & Co., Albany and Washington streets, N. Y.....4
Warner A. B. & Son, 28 and 29 West, N. Y.....4
Williamson James & Co., 69 Wall, N. Y.....4
Whitney A. R., 58 Hudson, N. Y.....4

Iron, Pig, *Importers of.*
Bellaire Nail Works, Bellaire, O.....15
Clark E. W. & Co., Philadelphia, Pa.....5
Lee James & Co., 72 Pine, N. R.....4
Lundell, Chas. G. (Swedish), Boston, Mass.....6
Williamson James & Co., 69 Wall, N. Y.....4

Iron, Sheet. *Manufacturers of.*
Hoopes & Merry, 547 W. 15th st., N. Y.....6
Lefferts Marshall & Co., 90 Beekman, N. Y.....4
Marshall Iron Co., Newport, Del.....4
Wood W. D. & Co. Pittsburgh, Pa.....4

Iron Stable Fixtures.
E. T. Barnum's Wire and Iron Works, Detroit, Mich.....3
Howard & Morse, 45 Fulton, N. Y.....2

Jacks.
Obl Geo. A. & Co., East Newark, N. J.....45

Jack Screws.
Seeger Mfg. Co., Springfield, Mass.....34

Lamps, Furnace.
Taylor & Boggis, Cleveland, O.....44

Lanterns. *Manufacturers of.*
Dietz R. E., 54 and 56 Fulton, N. Y.....60
Howard & Morse, 45 Fulton, N. Y.....2
Miller Edw'd & Co., 35 Warren, N. Y.....37

Lead, Pig.
U. S. Smelting Works, Philadelphia, Pa.....16

Lemon Squeezers.
Onderdonk R., 405 Grand, N. Y.....30

Levels.
Disston Henry & Sons., Philadelphia.....44

Locks and Knobs.—*Manufacturers of.*
Bohannan Wilson, Broadway and Kossuth, Brooklyn, E. D.....37
Durrie & McCarty, 97 Chambers, N. Y.....27
D. K. Miller Lock Co., Philadelphia, Pa.....34
Eagle Lock Co., Terryville, Conn.....34
Hillebrand & Wolf, 110 S. 8th, Philadelphia.....39
Romer & Co., Newark, N. J.....12
Smith & Egge Mfg. Co., Bridgeport, Conn.....8
Yale Lock Mfg. Co., 53 Chambers, N. Y.....3

Machinery,
Adt John, New Haven, Conn.....6
Barnes W. F. & John, Rockford, Ill.....28
Bliss & Williams, 167 Plymouth, Brooklyn.....48
Box Alfred & Co., 312 Green, Phila.....49
Cooke & Co., 6 Cortlandt, N. Y.....49
Forsaith S. C. & Co., Manchester, N. H.....45
Garvin E. E. & Co. 139 Centre, N. Y.....49
L. B. Flanders Machine Works, Philadelphia, Pa. 44
Monawk & Hudson Mfg. Co., Waterford, N. Y.....47
New England Machinery Depot, Philadelphia, Pa. 37
Pittsburgh Mfg. Co., Pittsburgh, Pa.....47
Purdy Machine Co., Cleveland, O.....
Rogers J. F. & Co., 107 Liberty, N. Y.....49
S. A. Woods Machine Co., 91 Liberty, N. Y.....49
Sellers Wm. & Co., Phila. and 79 Liberty st., N. Y. 49
Stokes & Parrish, Philada., Pa.....48
The Stiles & Parker Press Co., Middletown, Ct.....50
Wetherill Robert & Co., Chester, Pa.....49
York & Smith, Cleveland, O.....22

Machinery (Barnes's Foot Power.)
Little Chas. E., 50 Fulton, N. Y.....

Machine Screws, *Makers of.*
Fellows John, Williamsburg, N. Y.....30

Machinists' Tools and Supplies.
Blaisdell P. & Co., Worcester, Mass.....47
Box Alfred & Co., 312 Green, Philadelphia, Pa.....49
Brooks A. G. & Winebrener, Philadelphia, Pa.....22
Bullard E. P., 14 Dey, N. Y.....
Cooke & Co., 6 Cortlandt, N. Y.....49
Flanders L. B., 1025 Hamilton, Philadelphia, Pa....44
Geo. Place Machinery Agency, 121 Chambers, N.Y 22
Harrington E. & Son, 15th st. and Pennsylvania ave., Philadelphia, Pa.....49
J. Gray Machinery Depot, 37 Dey, N. Y.....22
King J. M. & Co., Waterford, N. Y.....8
Rogers J. F. & Co., 107 Liberty, N. Y.....49
Sellers Wm. & Co., Phila. and 79 Liberty st., N. Y. 49
Wickersham & Co., Philadelphia, Pa.....45
Wright John H., Bridgeport, Conn.....42

Mallets.
N. Y. Handle and Mallet Works, 456 E. Houston....13
Penfield Block Co., Lockport, N. Y.....27

Measuring Tapes.
Eddy Geo. M. & Co., 353 Classon Ave., Brooklyn, N.Y.12

Meat Choppers.
Kimball Shovel Co., Baltimore, Md.....27
Lloyd, Supplee & Walton, 625 Market, Phila.....27

Metals.
Detroit Copper and Brass Rolling Mills, Detroit, Mich.....2
Dickerson, Van Dusen & Co., 29 and 31 Cliff, N. Y... 2
Goldsmith Moses & Son, Charleston, S. C.....6
Merchant & Co., Philadelphia.....39
Naylor & Co., 99 John, N. Y.....42
Northrop A. C., Waterbury, Conn.....
Paulsen Wm., P. O. Box 3708, New York.....6
Phelps, Dodge & Co., Cliff, bet. John & Fulton, N. Y. 2
Phosphor Bronze Smelting Co., Limited, 512 Arch, Philadelphia.....13
Purves A. & Son, cor. South and Penn, Phila.....5
Quincy J. W. & Co., 98 William, N. Y.....4
Read D. W. R. & Co., 2059 Walnut, Phila.....4
Schoenberg Metal Mfg. Co., 526 & 530 E. 20th, N. Y.. 2
Starr John, Halifax, Nova Scotia.....11

Metallurgists.
Booth, Garrett & Blair, 919 Chant, Philadelphia.....5
Britton J. Blodgett, 330 Walnut, Philadelphia.....32

Metal Separator.
Sawyer Ezra, Worcester, Mass.....46

Mills, Portable.
North Carolina Mill Stone Co., Westminster, Md..30

Mincing Knives.
Jennings C. E. & Co., 96 Chambers, N. Y.....39
Phila. Novelty Mfg. Co., 821 Cherry, Phila., Pa.....11

Mine Lamps.
Leonard Bros., Scranton, Pa.....7

Mineral Wool.
U. S. Mineral Wool Co., 16 Cortlandt, N. Y.....37

Miners' Candles, *Makers of.*
James Boyd's Sons, 10 and 12 Franklin, N. Y.....12

Molasses Gates.
E. Stebbins Mfr. Co., Brightwood P. O., Springfield, Mass.....37

Molding Sand.
Chapman W. J., Baltimore, Md.....44
Emerick J. A. & Co., 1046 Beach, Philadelphia, Pa. 3
Paxson J. W. & Co., 514 Beach, Philadelphia, Pa... 5
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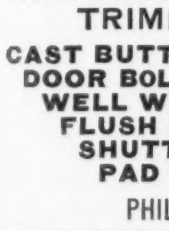
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Horse Hay Forks

And

Sprout's

HAY ELEVATORS, PULLEYS and GRAPPLES.

Send for Circulars.

Muncy, Lycoming Co., Pa.

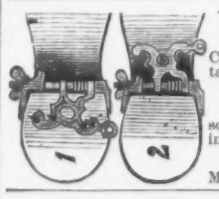


WM. ESTERBROOK,

Wholesale Manufacturer of

Coal Hods,

311 Cherry St., PHILADELPHIA.



THE SAFETY

Combines every advantage possible in an

ICE CREEPER.

Attaches with a thumb screw; turns over into instep; one size for all.

R. P. SCOTT & CO.,

Manufrs., NEWARK, N.J.

FOR SALE,

At New England Machinery Depot,

308 North Third St., Philadelphia, Pa.

Horizontal, Vertical and Locomotive Tubular Boiler, from 3 to 60 H. P., in stock and larger to order. Engines all sizes. Pumps, Heaters, Injectors, steam and hand Brick and Mortar Hoists. Boiler Test Pumps. The new Gravity Coffee Roaster. All of the above constantly kept in stock. Send for circular and price list.

STOVE REPAIRS.

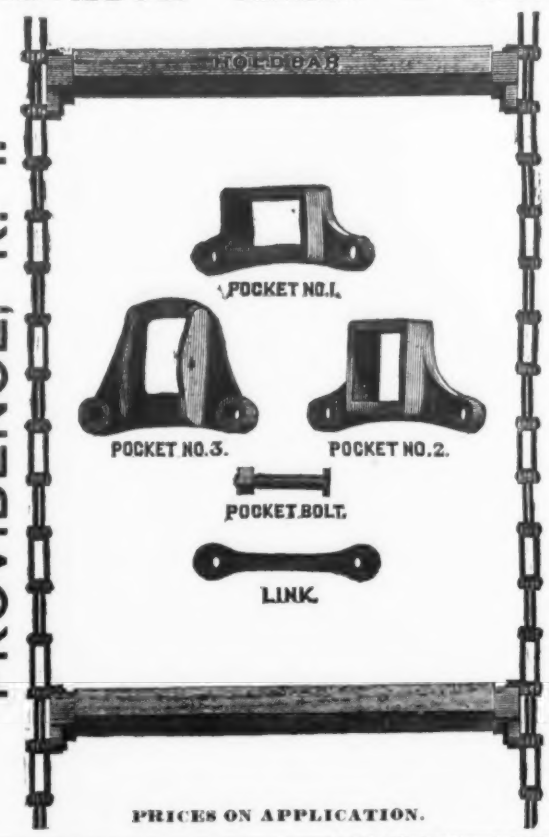
Repairs for Stoves made at Troy, Albany, Rochester, Cleveland, Buffalo, Boston, St. Louis, Quincy, Chicago, Milwaukee and elsewhere, at

W. C. METZNER,
127 W. Randolph St., Chicago, Ill.

ICE ELEVATOR CHAIN & BLOCKS.

PROVIDENCE TOOL CO.,

PROVIDENCE, R. I.



PRICES ON APPLICATION.

HENRY B. NEWHALL, 105 Chambers St., NEW YORK AGENT.
J. H. WORK, 13 Pearl St., BOSTON AGENT.
S. H. & E. Y. MOORE, 163 & 165 Lake St., CHICAGO AGENT.

THE GENUINE STEBBINS

MOLASSES & OIL GATES,

MANUFACTURED ONLY BY

E. STEBBINS MFG. CO.

BRASS FOUNDERS AND FINISHERS.



Sole Manufacturers

Stebbins and Brightwood

COMPRESSION

AND

GROUND KEY WORK.

Send for circular and price list.

H. M. BREWSTER, Agent

Brightwood P. O., Mass.



Office of NELSON LYON,

SOLE MANUFACTURER OF

Lyon's Patent Metallic Heel Stiffeners,

Also, Manufacturer of

BRUSHES

Of Every Description,

Nos. 17 & 19 Green St.,

Albany, N. Y., Dec. 8, 1880.



To All Whom it May Concern:

To-day a decree in my suit against G. T. Fisher & Co., of Detroit, for an infringement of my patent, was made and entered, of which the following is an extract:

At a session of the Circuit Court of the United States for the Eastern District of Michigan, held at Detroit &c., on Wednesday, the 8th day of December, 1880. Present, Hon. H. B. Brown, District Judge.

NELSON LYON *against* GUYON T. FISHER, *et al.*

It is ordered, adjudged and decreed, that the act entitled "An act for the relief of Nelson Lyon and Jeremiah S. James," passed by Congress and approved April 1, 1880, &c., is a good, valid and constitutional act.

That the original patent, bearing date July 9, 1872, and numbered 128,844, granted and issued to Joseph Barsaloux, Jeremiah S. James and Nelson Lyon, when corrected by the Acting Commissioner of Patents, as directed by said act, was a good and valid patent.

That the said Joseph Barsaloux was the original and first inventor of the improvements in metallic stiffeners for boot and shoe heels mentioned and described in said letters patent.

That the Reissued Letters Patent No. 9198, dated May 11, 1880, granted to said Nelson Lyon for an improvement in metallic heel stiffeners for boots and shoes, originally patented as aforesaid, is a good and valid patent; that said Lyon is exclusively possessed of said Letters Patent and the invention thereby secured.

That the defendants, G. T. Fisher & Co., and each of them, have infringed upon the said patents and upon the exclusive rights of said Lyon under the same.

That said Lyon receive of said defendants all the profits, &c., they have made, and in addition thereto all the damage he has suffered by reason of the infringements by the defendants, and also the costs, charges and disbursements in the action.

It is also further ordered, adjudged and decreed, that a perpetual injunction be issued against said defendants, according to the prayer of the said complainant's bill.

You are also hereby notified that the perpetual injunction has been issued and served on the defendants

All questions as to damages and settlements in relation to infringements under my patents must be addressed to and made with my attorney, WILLIAM H. KING in my care at the above address.

NELSON LYON.

SABIN MFG. CO.,

MONTPELIER, VT., MANUFACTURERS OF

DOUBLE-ACTING SPRING BUTTS,

SABIN'S LEVER DOOR SPRINGS, For heavy doors,

BOSS AND CROWN SPRINGS, For light doors.

Send for Catalogue. Represented in New York by *DAVID HYMES & CO., 99 Church St.*

RIVETS C. F. HARRISON, BOILER, BRIDGE & TANK **RIVETS**

CUYAHOGA FALLS, OHIO.

New York Wholesale Prices, November 2, 1881.

HARDWARE.

Anvils.
Eagle Anvils American ..... ₩ lb 10c dis 20 %
Wright's ..... 10½c @ 11c
Armitage's Mouse Hole ..... 9¾ @ 9¾c
Trenton 10½c
Wilkinson's ..... 12 c

Anvil, Vise and Drill.
Millers Falls Co., $28.00 ..... dis 20 %

Augers and Bits.
Coun. Valley Mfg. Co.
Douglass Mfg. Co.
C. E. Jennings & Co.
Humphreysville Mfg. Co. } dis 40 % from list of Jan 7, 1880
Ives
Hrecher (French, Swift & Co.)
Irlswold
Nobles Mfg. Co.
Watrous & Co., Extension Lip ..... dis 35 %
Cook's, Douglass Mfg. Co. ..... dis 40&10 %
Snell Mfg. Co.'s C. S. Augers ..... dis 40 %
" " B. Machine ..... dis 40 %
" " C. S Bits ..... dis 40 %
" " Jenning's Bits ..... dis 40 %
Patent Scild Head ..... dis 30 %
Lewis' Patent Single Twist ..... dis 40 %
Russell Jennings' Auger, Dowel, Machine-Dowel and Hand-Rail Bits ..... dis 10&10&10 %
Russell Jennings' Augers ..... dis 10&10&10&10 %
Russell Jennings' Car and Machine Bits, Boring-Machine and Millwrights' Augers dis 10&10&10 %
Imitation Jenning's Bits ..... dis 40&45 %
Ives & " Jennings " Bits ..... dis 33⅓&10 %
Andrews Bits ..... dis 40 %
Expansive Bits, Clark's, small, $18; Pge. 26 ..... dis 25 %
" " Ives ..... $20 @ $30 dis 33⅓ %
" " Blake's ..... $30 dis 40 %
" " Parmelee's ..... $20 and $30 dis 33⅓ %
Hollow Augers Ives' } dis 15&10 %
" " French, Swift & Co
" " Douglass ..... dis 10&10 %
" " Bonney's Adjust. ₩ doz $48 dis 20&10 %
" " Stearns' Adjust. ₩ doz $48 dis 20&10 %
" " Ives' Expansive, each $4.50 dis 30&10%
" " Universal Expansive, ea $4.50 dis 20 %
Woods ..... dis 25 %
Gimlet Bits ..... $7.50 ₩ gross, dis 45 %
" Diamond ..... ₩ doz $1.10 dis 20&10 %
" "Bee" ..... dis 35&10 %
Double Cut Gimlet Bits, Shepardson's ..... dis 40 %
" " Ct. Valley Mfg. Co. ..... dis 30&10 %
" " Hartwell's ..... dis 60&10 %
" " Douglass' ..... dis 40 %
" " Ives' ..... dis 50 %
Morse's Bit Stock Drill ..... dis 25 %
L. Hommedieu's Ship Augers ..... dis 15 %
Watrous Ship Augers ..... dis 15 %

Awl Hafts.
Sewing Brass Ferrule ..... $3.50 ₩ gross—dis 40&10 %
" " ..... 3.50 " dis 40&10 %
Patent Sewing, Short ..... $1.00 ₩ doz—dis 40&10 %
" " Long ..... $1.40 ₩ doz—dis 10 %
Patent Peg Plain Top ..... $10.00 ₩ gross—dis 40&10 %
" " Leather Top ..... 12.00 " dis 40&10 %

Awls, Brad Sets, &c.
Awls, Sewing, Common ..... ₩ gross $1.70—dis 25&10 %
" Shouldered Peg ..... ₩ gross 2.45—dis 25&10 %
" Patent Peg ..... ₩ gross .63—dis 25&10 %
" Shouldered Brad ..... ₩ gross $2.70—dis 25&10 %
" Handled Brad ..... $7.00 ₩ gross—dis 25&10 %
" Handled Scratch ..... $7.00 ₩ gross—dis 25&10 %
" Socket Scratch ..... $1.00@$1.25 ₩ doz—net
Brad Sets, Aiken's ..... ₩ doz $12.00—dis 45&10 %
" No. 42, $10.50; No. 43, $12.50 ..... dis 70&10 %
" Stanley's Excelsior, No. 1, $9.60 ..... dis 30&10 %
" " " No. 2, 4.80 ..... dis 30&10%
" " " No. 3, 7.80 ..... dis 30&10%

Axes.
Single Bit 4¼ to 4¾ and under ..... ₩ doz $10.50 net
" 4½ to 6 and over ..... ₩ doz $10.50 net
" Beveled ..... 50 c ₩ doz advance
Double Bit, 4½ to 4¾ and under ..... ₩ doz $19.00 net
" 4¾ to 6 and over ..... ₩ doz $20.00 net
" Beveled ..... $1.00 ₩ doz advance

Axle Grease.—Frazer's ..... ₩ lb 6c

Axles—Standard list ..... dis 45 %

Bag Holders.
Sprengle's Patent, per doz. $18 ..... dis 40 %

Balances.
All Spring Balance ..... $ ..... dis 15&10 %

Bells.
Hand, Light Brass ..... dis. 60&10 %
" Extra Heavy ..... dis 45 %
" White Metal ..... dis 60 %
" Silver Chime ..... dis 20&10 %
" Globe (Cone a Patent) ..... dis 25&10 %
Gong, Abbe's ..... dis 20&10 %
" Yankee ..... dis 30&10 %
" Barton's ..... dis 30&10 %
Crank Taylor's ..... dis 25&10 %
" Brook's ..... dis 60&10&2 %
" Cone's ..... dis 10 %
" Connell's ..... dis 35 %
Lever, Sargent's ..... dis 55&10 %
" Taylor's Bronze or Plated Lever ..... net
" " Japanned Lever ..... dis 25&10 %
" R. & E. M. Co.'s ..... dis 45&10 %
Pull, Brook's ..... dis 60&10&2 %
" Western ..... dis 25&10 %
Call ..... dis 25 %
Cow, Common Wrought ..... dis 55 & 10 %
" Western ..... dis 20&10 %
" Sargent's new list ..... dis 55&10 %
Kentucky "Star" ..... dis 20&10 %
" Sargent's new list ..... dis 55&10 %
Dodge's Genuine Kentucky, new list—
08. 0 1 1¼ 2 3 4 5 6 Hog } dis 50 %
$12.00 10.00 9.00 8.00 6.00 5.00 3.50 2.50 5.00,
Texas "Star" ..... dis 40 %

Bellows.
Blacksmiths', Common ..... dis 45 %
" Extra and Pittsburgh Pattern ..... dis 20 %
Moulders ..... dis 25 %
Hand Bellows ..... dis 25 %

Belting, Rubber.
N. Y Belting and Packing Co. ..... dis. 20&10 %

Bit Holders.
Extension, Barber's ..... ₩ doz $15.00—dis 40&5 %
" Ives' ..... ₩ doz $15.00—dis 40 %
Diagonal ..... ₩ doz $24.00—dis 40 %
Angular ..... ₩ doz $24.00—dis 40&5 %

Blind Adjusters.—Domestic ..... ₩ doz $4.00, dis 15 %
Excelsior ..... ₩ doz $10.00.—dis 50&10&2 %

Blind Fasteners.
Mackrell's ..... per doz. pairs, $1.00, dis 10%
Van Sand's .. Screw pattern, per gro., $10.00 ..... dis 35 %
" " old pattern ..... ₩ gross, $8.00 net
Washburn's Patent ..... ₩ gross $10.50 net
Merriman's ..... new list net
Mackrell's ..... ₩ doz. pairs, $0.65, dis. 10 %

Blind Staples.
Barbed, ¼ in. and larger ..... ₩ lb 11c net
" ⅜ in ..... ₩ lb 13c net

Blocks.
Differential Pulley Blocks ..... dis 20 %
Fernfield Block Co., Rope and Iron Strap'd ..... dis 40 %
" " " Wrot. Iron Com. bushed ..... dis 25 %
" " " " all steel roll'r ..... dis 35 %
" " " Sheaves " ..... dis 35 %
Stanley R. & L. Co., Rope and Iron Strap'd ..... dis 40&10 %

Bolts.
Cast Iron Barrel, Shutter, &c ..... dis. 50&10
Cast Iron Chain (Sargent's list) ..... dis 60&10
Ives' Pat. Door Bolts ..... dis 60
Wrought Barrel ..... dis 60&10 %
" Square ..... dis 60&10 %
" Shutter, all Iron, Stanley's list ..... dis 60&10&10 %
" " Brass Knob ..... dis 20&10 %
" " Sargent's list ..... dis 60&10 %
" Sunk Flush, Sargent's ..... dis 75&10 %
" " Stanley's ..... dis 60&10&75 %
" B. K. Flush, Com'n, Stanley's ..... dis 60 %
" " Ex. Heavy ..... dis 40&10&10 %
" Plated Knob & Slide Flush ..... dis 40&10&10 %
Carriage and Tire, Common ..... dis 60 %
" Philadelphia, new list ..... dis 60&5 %
" Philada. Pattern ..... dis 70&5 %
" Shelton's ..... (old list) dis 60&10 %
Union Carriage ..... dis 70 %
R. B. & W. Carriage (old list) ..... dis 60 %
Fire, Am. Screw Co.'s, Phila, new list, Nov 1, '79 ..... dis 75 %
" "Bay State" ..... dis 80&10 %
" R. B. & W., new list ..... dis 70&10 %
Stove—American Screw Co.'s ..... dis 40 %
" R. B. & W ..... dis 40 %
R. & E. Mfg. Co ..... dis 40 %
Plow ..... dis 40 %
" R. B. & W ..... dis 40 %
Machine ..... dis 60 %
Cut Ends ..... dis 60 %

Borax ..... 15c ₩ lb net

Boring Machines.

	Upright.	Angular.	
First quality, no Augers	$2.50	$0.75	dis 40 %
Phillips' with Augers	7.00	7.50	net
Jennings & Co., no Augurs	6.50	6.75	dis 40 %

Boxes.
Interchangeable Shelf Boxes ..... dis 20 %

Braces.
O. S. Backus ..... dis 50 %
Wilson Mfg. Co. ..... dis 10 %
Barber's ..... dis 30&5 %
Stafford's Patent ..... dis 50&10 %
Ives' Patent Braces ..... dis 50&55 %
Common Ball (American) ..... dis 50 %
Ambidex ..... dis 40 %
Barker's Jumped ..... dis 30 %
Empire ..... dis 30 %
Buffalo Ball ..... dis 40 %

Brackets.—Shelf (Sargent's) plain ..... dis 55&10 %
" " fancy ..... dis 60&10 %
Reading ..... dis 60&10 %

Bright Wire Goods list of Dec. 15, 879. dis 60&10 %

Bull Rings.—Union Nut Co. ..... d28 50&20
Sargent's ..... dis 60&10%
Jenkins' ..... low list dis 15%
Emerson, Beckley & Co.'s ..... dis 50&10%

Butts
Wrought Brass ..... dis 75&5 %
Cast Brass, Tiebout's ..... dis 30 %
" Corbin's ..... dis 20&10 %
Fast Joint, Narrow ..... dis 40&10 %
" Broad ..... dis 40&10 %
Loose Joint ..... dis 50&10 %
" Japanned ..... dis 10&10 %
" with Acorns ..... dis 10&10 %
" Japanned, with acorns ..... dis 5&10 %
Parliament Butts ..... dis 55&10 %
Mayer's Hinges ..... dis 50&10 %
Loose Pin, no Acorn ..... dis 50&10 %
" Acorns ..... dis 50&10 %
" " Japanned ..... dis 55&10 %
" " " Plated Tips ..... dis 55&10 %

WROUGHT IRON.

Fast Joint Narrow ..... dis 45&10 %
" Lt. Narrow ..... dis 45&10 %
" Broad ..... dis 45&10 %
Loose Joint, Broad ..... dis 50&10 %
Table Butts, Back Flaps, &c ..... dis 45&10 %
Inside Blind, Regular ..... dis 45&10 %
" Light ..... dis 45&10 %
Loose Pin, Wrt ..... dis 50&10 %
" " Light ..... dis 45&10 %

Spring Hinges
American Spiral Spring Butt Co., Jap'd ..... dis 25 %
" " " Fancy ..... dis 20 %
Gem Spiral Spring Butts, Japanned ..... dis 25 %
" " " Ornamental ..... dis 20 %
Geer's Spring and Blank Butts ..... dis 25 %
Sabin Mfg. Co.'s Double Acting ..... dis 35 %
Union Spiral Spring, Japanned ..... dis 25 %
" " Ornamental ..... dis 20 %
Union Spring Hinge Co.'s ..... dis 25 %
American Spring Hinge Co.'s ..... dis 25 %
Union Mfg. Co. ..... dis 25 %
Bommer's ..... dis 25 %
Buckman's ..... dis 70 %
Blind Butts, Parker ..... dis 45&10 %
" Palmer ..... dis 70 %
" Seymour ..... dis 70 %
" Shepard's "Double Locking" Nos. 1 & 2 ..... dis 70 %
" Shepard's "Noiseless," Nos. 50 & 60 ..... 70 %
" Lull & Porter ..... dis 60&10 %
" Nicholson ..... dis 45&10 %
" Huffer ..... dis 60 %
" Clark's, Nos. 1, 3, 5, 40, 45 and 50 ..... dis 70 %
" Sargent's No. 1, 3 ..... dis 60⅔&2&10 %
" " No. 12 ..... dis 70&10 %
" Reading's Gravity ..... dis 60⅔&10 %
Clark's Improved Seutter Hinge ..... dis 70 %

Bow Pins.
Hotchkiss' ..... dis 25 %
Humason, Beckley & Co.'s ..... dis 60 %
Sargent & Co.'s ..... $10.70 and $21.40. dis 60&10&10 %

Butchers' Cleavers.
Humason & Beckley Mfg. Co. ..... dis 20
Bradley's ..... dis 25
Beatty's ..... dis 25&5 %

1	2	3	4	5	6	7	8
$16.50	19.00	21.50	24.00	27.00	30.00	33.50	36.50

Can Openers.
Messenger's Comet ..... ₩ doz $3.00. dis 25 %
American ..... ₩ gross $7.50. dis 10 %
Duplex ..... ₩ doz 2.50. dis 15&20 %
Lyman's ..... ₩ doz $3.75, dis 20 %
No 4, French ..... ₩ doz $2.25, dis 55 %
No. 5, Iron Handle ..... ₩ gross $7.50 dis 10 %
Eureka ..... ₩ doz $2.50, dis 10 %
Sardine Scissors ..... ₩ doz $7.00, dis 55 %
Star ..... ₩ doz $5.00, dis 20&25 %
Sprague ..... dis 75&10 %
"Worlds Best" per gross, No. 1, $12; No. 2, $21; No. 3, $36 ..... dis 50 %

Caps—Percussion, ₩ 1000.
U. M. C., F. C. trimmed ..... 80c } dis
" " F. L. ground ..... 70c } 10&10
U. M. C. Cen. fire ground ..... 70c } dis
" Double W. proof ..... $1.40 } 10&5 %
G. D. & S. B ..... 75c, dis 5 %
Double Waterproof, in 1 10's ..... $1.40 } dis
Colt's Pistol, " ..... 70c } 10 %
F. L ..... 60c } dis 10c
E. B. 1-10, Trimmed ..... 64c } 5 %
E. B. 1-10 Ground Edge 70c
E. B. 1-10 Musket, in 1-10's ..... 80c dis 10&10 %

Cartridges.—Rim ..... dis 70&10 %
Central Fire ..... dis 20&10 %

Cards.—Horse and Curry..new list, July, '81, dis 10 %
Cotton ..... " ..... dis 10 %
Wool ..... " ..... dis 10 %

Carpet Stretchers.
Cast Steel, Polished ..... ₩ doz $5.00, dis 30 %
" Iron Steel Points ..... ₩ doz $2.00, dis 45 %
Bullard's ..... dis 25 %

Casters.
Bed ..... dis 40&5 %
Plate and Shallow Socket ..... dis 40&5 %
Deep Socket ..... dis 25&10 %

Cattle Leaders.
Humason, Beckley & Co.'s ..... dis 60&10 %
Sargent's ..... dis 60⅔&10 %

Chain.
Trace, 6¼-1-2 ..... ₩ pair 79c
" 6¼-10-3 ..... ₩ pair 70c } dis 40 %
" 7-10-2 ..... ₩ pair 86c
German Halter Chain ..... dis 55&10 %
" Coil ..... dis 55&10 %
Covert Halter, Hitching and Breast ..... dis 35%
Oneida Halter Chain (old list) ..... dis 40 %
Galvanized Pump Chain ..... ₩ lb 9½c net
Jack Chain, Iron ..... dis 60&10 %
" Brass ..... dis 50&10 %

Chalk.
White ..... ₩ gross 800 net
Red ..... ₩ gross 800 net
Blue ..... ₩ gross 1000 net
White Crayons ..... ₩ gross 100 net

Chisels.
Socket Framing, Crossman ..... dis 55&5 %
" " Arlington Edge Tool Co. ..... dis 60&10 %
" " Buck Bros. ..... new list, dis 33⅓&5
" " Merrill ..... dis 60&10 %
" " Witherby Tool Co. ..... dis 60&10 %
" " Douglass' ..... dis 60&10 %
" Firmers Crossman ..... dis 60&5 %
" " Arlington Edge Tool Co. ..... dis 60&10 %
" " Buck Bros. ..... new list, dis 33⅓&5
" " Merrill ..... dis 60&10 %
" " Witherby Tool Co. ..... dis 60&10 %
" " Douglass' ..... dis 60&10 %
" Corner ..... dis 40 %
Tanged Firmers or Socket, " ..... dis 40 %
" " Butcher's ..... $5.00 @ 5.25 to £
" " Spear & Jackson's ..... 5.00 to £
" " Buck Bros. (Shank) ..... 5.25 to £

Clamps.
Iron, Providence Tool Co.'s, Wrt. Iron ..... dis 25 %
" Adjustable, Gray's ..... dis 20 %
" " Lambert's ..... dis 20 %
" " Snow's ..... dis 40&5 %
" " Hammer's ..... dis 15 %
" " Stearns' ..... dis 20&10 %
" Cabinet, Sargent's ..... dis 70&10 %
" Carriage Makers', Sargent's ..... dis 60&10 %
" Cord and Tape (T. & S. Mfg. Co.) ..... dis 30 %

Clips, Axle.
Norway or Best ..... dis 40&5 %
Superior ..... dis 65&5 %

Coal Hods.
Griffiths ..... dis 33⅓ %

Cockeyes ..... dis 35&10 %

Cocks, Brass.
Backing ..... new list, July 10, '80 } dis 40 %
Globe ..... " " "
Plain Bibbs ..... " " "
Ale and Beer ..... " " "

Coffee Mills.
Board and Box ..... dis 45 %
Wilson's ..... dis 45 %
Selsor's Pat ..... $9.50, $10.50, dis 25 %
American (Enterprise Mfg. Co.) ..... dis 30 %
French Steel ..... dis 25 %
The "Swift" (Lane Bros.) ..... dis. 30 %

Combined Dinner Pail and Lantern.
Per doz $15.00 ..... dis 30 %

Compasses, Dividers, &c.
Compasses ..... dis 55 %
Calipers ..... dis 55 %
Dividers ..... dis 55 %
Bemis & Call Co.'s Dividers ..... dis 60&5 %
" " Compasses & Calipers ..... dis 60&5 %
" " Wing & Inside or Outside ..... dis 50&5 %
" " Double ..... dis 60 %
" " Call's Pat. Inside ..... dis 30 %
Excelsior ..... dis 50 %
Miller's Patent ..... dis 25 %

Coopers' Tools.
Bradley's ..... dis 15 @ 20 %

Corkscrews.—Humason & B. ..... dis 33⅓ %
Clough's Wire ..... dis 25 %

Corn Knives and Cutters.—Bradley's ..... dis 10 %
Wadsworth's ..... dis 33⅓ %

Crow Bars.
Cast Steel ..... ₩ lb 8½c
Iron, Steel Points ..... ₩ lb 6½c

Curling Irons, &c.
⅛, ⅝, ¾ in., $1.80 2.00, 2.40 ..... dis 10 %
Curling Tongs ..... ₩ doz $3.60, dis 10 %
Pinching Irons ..... ₩ doz 7.50, dis 20 %

Curry Combs.
Fitch's new list ..... dis 50 %
Hotchkiss Novelty ..... new list, July, 1880, dis 25 %
" Excir. Supr. Champion ..... dis 25 %
Lawence "Perfect" ..... dis 25&10 %
Rubber ..... ₩ doz $10.00, dis 15 %

Curtain Pins.—Silvered Glass ..... net
White Enamel ..... net

Cutlery
Meriden Cutlery Co. (Table) ..... net
Am. Miller Bro.'s Cutlery Co. ..... dis 25 %
Humason & Beckley, Pocket ..... dis 33⅓ %
Naugatuck Cutlery Co. ..... list net
Aaron Burkinshaw's Pocket ..... dis 25 %

Dog Collars.
Embossed Gilt ..... dis 20 %
Leather ..... dis 40 %
Brass ..... dis 40 %
Celluloid ..... dis 40 %

Door Springs.
Torrey's Rod ..... ₩ doz $2.10, dis 10 %
Gray's " ..... ₩ doz $1.70, net
Bee Rod ..... ₩ doz $1.70, net
Warner's ..... dis 15&10 %
Gem (Coil)—
No. 1, Large, Japanned ..... ₩ doz $4.00 } dis
No. 2, Medium, " ..... ₩ doz 2.75 } 25&10 %
No. 3, Small, " ..... ₩ doz 2.00
Star (Coil)—For Cop'd, Nickel-Plated, &c. see list.
No. 4, ("Snoo Fly") Screen door size ₩ doz $1.50
No. 5, Screen Door Size ..... ₩ doz $2.00 } dis
No. 6, Medium ..... ₩ doz 2.75 } 30&10 %
No. 7, Large ..... ₩ doz 4.00
Sabin's Lever ..No. 1, $1; 2, $1.40; 3, $2; 4, $2.50; dis 30 %
Sabin's Boss ....No. 1, $2.40; 2, $4.20; 3, $3.00. dis 40 %
Sabin's Crown ..... ₩ doz $2.75, dis 50 %
Philadelphia ..... 5 in., $5.00; 8 in., $7.75 dis 35 %
Barker's Concealed ..... dis 20 %
Cowell's ..... No. 1, $18.00; No. 2, $15.00 ₩ doz, dis 50 %
Rubber, complete ..... ₩ doz $1.80, dis 10 %
Hercules ..... dis 40 %

Drawing Knives.
Arlington Edge Tool Co. ..... dis 60&10 %
Crossman's No. 1 ..... dis 60&5 %
Merrill ..... dis 60&10 %
Nobles Mfg. Co ..... dis 15 %
Bradley's ..... dis 35 %
Adjustable Handle ..... dis 20 %
Witherby Tool Co. ..... dis 60&10 %
Douglass ..... dis 60&10 %

Drills and Drill Stocks.
Blacksmiths' ..... each $2.50 dis 10 %
Blacksmiths Self Feeding ..... each $7.50, dis 20 %
Breast P. S & W ..... dis 20&10 %
" Hotchkiss ..... dis 20 %
Breast, Wilson's ..... dis 20 %
" Miller's Falls ..... each $5.00. dis 25 %
" Bartholomew's ..... each, $2.50 dis 25&10 %
Ratchet, Merrill's ..... dis 25 %
" Ingersoll's ..... dis 20 %
" Whitney's ..... dis 20 %
" Weston's ..... dis 20 %
" Moore's Triple Action ..... dis 20 @ 25 %
Whitney's Hand Drill ..... dis 50 %
Wilson's Drill Stocks ..... dis 10 %
Automatic Boring Tools ..... each $2.25, dis 20 %

Drill Chucks.—Morse's Beach Patent ..... dis 30 %
" Adjust. each $10.00, dis 30 %
Danbury ..... $8.00, dis 30 %

Egg Beaters.
Dover ..... ₩ doz. $2.50 dis 2 %
Acme ..... $20 per gross, dis 33⅓&10 %
Standard ..... $24 per gross, dis 33⅓ %
National ..... ₩ doz $1.50, dis 33⅓ %
Family ..... per gross $15; per doz., $1.50 net

Elevator Buckets.
Mill E. Buckets, light, 3½ to 10 in. (Duc's Improved) ₩ 100 $15.00 @ $54.00, dis. 10 %
Mill E. Buckets, heavy, 4 to 10 inches (Duc's Improved) ₩ doz $5.60 @ $10.20 dis. 10 %
Storehouse. Duc's Pat.) 12 to 17, $12.00 @ $20.00, dis. 10 %

Emery and Emery Paper.
Regular numbers ..... ₩ lb 6c
Flour and F F ..... ₩ lb 4c
R. & A. Emery Paper ..... dis 25&30 %
Bibley's Emery and Crocus Cloth ..... dis 30 %
Large size, $16; Medium, $10.50 per ream; dis 15 %

Enameled and Tinned Ware.
Kettles ..... dis 45 %
Sauce Pans ..... dis 30 %
Tinned Sauce Pans ..... dis 30 %

Escutcheon Pins.
Brass ..... dis 50 %

Escutcheons.
Door Lock ..... Same discounts as Door Locks
Brass Thread ..... dis 45 %
Wood ..... dis 25 %

Faucets.
Fenn's ..... dis 40 %
Bohren's Pat. Rubber Ball ..... dis 25 %
Fenn's Cork Stops ..... dis 45⅔ %
Lane's (Self Measuring) ..... ₩ doz., $36.00, dis. 25 %
Star ..... dis 55&10 %
Frary's Patent Petroleum ..... dis 20&10 %
Wood and Metallic ..... dis 40 %
West's Patent Key ..... dis 45 %
Metallic Key, Leather Lined ..... dis 40 %
Cork Lined ..... dis 40 %
Enterprise (Self Measuring) ..... ₩ doz., $36.00. dis 30 %
J. Sommer's Best Metallic Key ..... dis 40 %
J. Sommer's Cork-lined, 1st quality ..... dis 50

Felloe Plates ..... ₩ lb 10c, dis 20 %

Files.
Auburn ..... $4.00 to £. dis 35 %
E. M. Poynton's ..... new list, dis 25 %
J. & Riley Carr ..... 4.50 to £
J. & Riley Carr, Horse Rasps ..... $4.75 to £
Johnson & Bro ..... dis 30 %
Butcher's ..... 4.50 to £
Walter Spencer & Co.'s "Diamond" ..... 4.50 to £
Fisher's ..... 4.75 to £
Moss & Gamble ..... 4.50 to £
H. Disston & Sons (new list) ..... dis 40 %
Heller Bros.' Horse Rasps ..... dis 30 %
Nicholson ..... dis 40 %
New American ..... dis 40 %
Union File Co ..... dis 40 %

Fluting Machines.
Knox, 4¼-inch Rolls ..... $3.40 each } dis 25 %
" 6 " " ..... 4.00 " }
Peerless, 4-inch Rolls ..... 4.00 each net
" 5 " " ..... 4.75 each net
Eagle, 3½-inch Roll ..... $2.15, dis 25 %
" 4¼ " " ..... $2.85, dis 25 %
Eureka, No. 1, 7-inch Roll ..... 5.00 each, dis 10 %
" No. 2 6-inch Roll ..... 4.00 each, dis 10 %
Crown, 1¼-in. $3.50 6-in. $6.50 each dis 25 %
Star ..... 4¼ in., $4.00 6 in. $6.00 each dis 10 %
Crown Jewel ..... 6 in., $5.40 each. dis 25 %
American, 4 in., $3; 6 in., $3.40; 7 in., $4.50 each, dis 25 %
Domestic Fluter ..... 1.40 each net
Geneva Hand Fluter, White Metal ..... ₩ doz $12, dis 25 %
Crown Hand Fluter, Nos. 1, $14.00; 2, $12.60; 3, $10.00 ₩ doz ..... dis 33⅓ %
Shepard Hand Fluter ..... No. 84 ₩ doz $10
" " " No. 70, $12.00; No. 66, $8.00 ..... net
Clark's Hand Fluter ..... ₩ doz $15.00, dis 33⅓ %
Combined Fluter and Sad Iron ..... ₩ doz 15.00, dis 30 %
Buffalo ..... ₩ doz 10.00, dis 10 %

Fluting Scissors ..... dis 45 %

Fly Traps.
Paragon ..... per doz, $3; net

Forks.
Hay, Manure and Spading ..... dis 40 %
Pitted "A 1, Rogers & Bro. ..... dis 40&5&5 %
" Reed & Barton ..... dis 40&5&5 %

Fruit and Jelly Presses.
Enterprise Mfg. Co ..... dis 30 %
American ..... dis 20 %

Fry Pans.
Burnished, list as follows ..... dis 5&10 %

No.	0	1	2	3	4	5	6	7	8
₩ doz	$3.00	$3.75	4.25	4.75	5.25	5.00	7.00	8.00	9.00

"Acme" ..... dis 40&10 %

Gauges.
Marking, Stanley's ..... dis 50&10 %
" Chapin's ..... dis 50&10 %
Wire ..... dis 10&10 %
" Disston's ..... dis 20 %

Gimlets.
Nail and Spike ..... dis 45 %
"Bee" Gimlets ..... ₩ gross $12.00 dis
"Eureka Gimlets ..... dis 50 %
"Diamond Gimlets ..... dis 40 %
Double Cut, Shepardson's ..... dis 40 %
" " Hartwell's ..... dis 50 %
" " Ives' ..... dis 50 %
" " Douglass' ..... dis 40%

Glue Pots.
Tinned and Enameled ..... dis 20&10 %
Family, Howe's "Eureka" ..... dis 25 %
" L. F. & C.'s "Handy ..... dis 25 %

Grindstone Fixtures.
Sargent's Patents ..... dis 70&10&10 %
Reading Hardware Co., new list. ..... dis 25&10 %

Gun Wads.
U. M. C. B. E. 11 up ..... $2.00 }
" " 9 & 10 ..... 2.30 }
" " 7 & 8 ..... 2.50 } dis 5&5 %
" P. E. 11 up ..... 3.10 }
" " 9 & 10 ..... 4.00 }
" " 7 & ..... 4.90 }

Halters.
Covert's Pat. Rope ..... dis 50%
Horse and Cattle Ties, Covert's ..... dis 50%

Hammers.
Maydole's ..... dis 15 %
Cheney's ..... dis 25 %
Hartford Hammer Co. (new list July 1, '81) ..... dis 20 %
Humason & Beckley ..... dis 50 %
Verree ..... dis 5 %
Magnetic Tack, Nos. 1, 2, 3, $1.25, 1.50 and 1.75 ..... dis 25&10 %
Warner & Noble's ..... dis 10 %
Kip's ..... dis 25 %
Yerkes & Plumb ..... dis 15 %
Wilkinson's Smiths' ..... 11½c ₩ lb net

Hand Cuffs and Leg Irons.
Providence Tool Co. Hand Cuffs, $15.00 ₩ doz } dis 10 %
" " Leg Irons, $25 ₩ doz }
Tower's ..... dis 25 %

Handles.—Door or Thumb Latches—

Nos.	0	1	2	3	4	
Per doz	$0.80	1.00	1.18	1 35	1.60	dis 60&10 %

Roggin's Latches ..... per doz 25c@40c net
Bronzed Iron Drop Latches ₩ doz $0.75 @ 0.85 dis 10 %
Jap'd Store Door Handles—Nuts. $1.62; Plate $1.08 no Plate, $0.87 ..... dis 10 %
Barn Door ..... per doz $1.62, dis 10 %
Wrought Chest ..... dis 65&10 %
Surface Chest ..... dis 55&10 %
Flush Chest ..... dis 60&10&10 %
Lifting ..... dis 55&10 %
Saw and Plane ..... dis 40&10 %
Boynton's Pat. Loop Saw Handles ..... dis 25 %
" " Centennial Saw Handles ..... dis 25 %
Hammer and Hatchet ..... dis 20 %
Brad Awl ..... ₩ gross $2.00, dis 30&10 %
Hickory Firmer Chisel, assorted, ₩ gross $4.50 }
" " " large, " 5.00 }
Apple " " assorted, " 5.00 } dis
" " " large, " 6.00 } 20&10
Socket " " assorted, " 5.00 } @
" Framing " assorted, " 5.00 } 25@10 %
File, assorted, ₩ gross ..... 2.75 }
Auger, assorted, ₩ gross ..... 5.00 }
" large, " ..... 7.00 }
Patent Auger, Ives' ..... dis 25
" Douglass' ..... ₩ set $1.25, net
" Swan's ..... ₩ set $1, net

Hangers.
Barn Door, old patterns ..... dis 60&10 %
" New England ..... dis 60&10 %
Challenge ..... dis 50 %
Climax (Anti-Friction) ..... dis 50 %
Sterling Improved (Anti-Friction) ..... dis 60&10 %
Cheritree ..... dis 50&10 %
Kidder's ..... dis 50&10&1 0 %
U. S. ..... 4 in., $12; 5 in., $14; dis 0c %
The "Boss" ..... dis. 50&10 %

Harness Snaps.
Henshaw's ..List of 1¼ changed to 14 00, dis 55 & 10 %
Judd's ..... " " 14.00, dis 55 & 10 %
Fitch's (Bristol) ..... " " 14.00, dis 55 @ 10 %
Hotchkiss' ..... dis 10 %
Andrews' ..... dis 10 %
Sargent's ..... dis 55&10 %
"German ..... dis 75 %
Covert ..... dis 4 &10 %
Covered Spring ..... dis 45&10 %

Hatchets.
Isaiah Blood ..... dis 25 %
Shingling, Nos. 1 2 3 ..... ₩ doz $7.25 $8.00 $8.75
Claw, Nos. 1 2 3 ..... ₩ doz 7.75 8.50 9.25
Lathing, Nos. 1 2 3 ..... ₩ doz 7.50 8.00 8.50
Hunt's ..... dis 2 &10 %
Shingling, Nos. 1 2 3 ..... ₩ doz $7.25 $8.00 $8.75
Claw, Nos. 1 2 3 ..... ₩ doz 7.75 8.50 9.25
Lathing, Nos. 1 2 3 ..... ₩ doz 7.50 8.25 9.00
Hurd's ..... dis 35&10 %
Shingling, Nos. 2 3 ..... ₩ doz $8.00 $8 50 $9.00
Claw, Nos. 1 2 3 ..... ₩ doz 9.00 9.50 10.00
Lathing, Nos. 1 2 3 ..... ₩ doz 8.00 .50 9.00
Yerkes & Plumb ..... dis 30
Shingling, Nos. 1 2 3 ..... ₩ doz $7.50 $8.00 $8.50
Claw, Nos. 1 2 3 ..... ₩ doz 8.25 8.75 9.25
Lathing Nos. ..... ₩ doz 7.00 8.00 8.50
Simmons ..... dis 2c
Shingling, Nos. 0 1 2 3 ..... ₩ doz $7.50 $8.00 $8.50 $9.00
Claw, Nos. 1 2 3 ..... ₩ doz 9.00 10.00
Lathing, Nos. 1 2 3 ..... ₩ doz 8.00 8.50 9.00
Broad, Nos. 1 2 3 4 ..... ₩ doz 9.00 10.00 12.00 14.00
Nos. 4 5 6 7 8 ..... ₩ doz 10.00 18.00 20.00 22.00
Collins ..... dis 10 %
Shingling, Nos. 1 2 3 ..... ₩ doz $6.00 $6.50 $7.00
Claw Nos. 1 2 3 ..... ₩ doz 6.50 7.00 7.50
Lathing, Nos. 1 2 3 ..... ₩ doz 6.00 6.50 7.00

Hay Knives.
"Lightning" ..... ₩ doz $20.00 net
Wadsworth's ..... dis 33⅓

Hinges.
Gate, Western ..... ₩ doz $6.25, dis 60&10 %
" N. E ..... ₩ doz $10.12, dis 60&10 %
" N. E. Reversible ..... ₩ doz $6.50, dis 60&10 %
Gate, Clark's Nos. 1, 2, 3 ..... dis 50&10 %
" N. Y. State ..... ₩ doz $6.50, dis 60&10 %
" Automatic ..... ₩ doz $12.50 dis 40 %
" Common Sense ..... dis 20&10 %
" Seymour's ..... dis 50&10 %
" Sheard's ..... Nos. 10, 20 & 25, dis 60 %
Rolled Blind Hinges ..... dis 60&10 %
Rolled Plate ..... dis 60&10 %
Rolled Raised ..... dis 60&10 %
Plate Hinges { 8, 10 & 12 in. $6.33 ₩ 100 lb } dis 10 %
"Providence" { over 12 in. $5.00 ₩ 100 lb }
Screw Hook and { 8, 10, 12 in., $6.00 ₩ 100 lb } dis 10 %
Strap { 14 to 36 in., $6.25 ₩ 100 lb }
Heavy Welded Hook { 8 to 12 in., $6.50 ₩ 100 lb } dis 10 %
{ 14 in. & up, 6.25 ₩ 100 lb }
Screw Hook and Eye { ⅝ & 1 in., 9c } dis
{ ¾ in. 10c } 20 %
{ ⅞ in. 12c }
Wrought Strap and T. list Dec. 20, '77 ..... dis 45&10&10 %

Hoes.—Riveted Shank ..... per doz, $4.00; dis 35 %
Socket ..... ₩ doz $4.25, dis 35 %
Grub ..... dis 15 %
Planters' ..... dis 35 %
Scovill Pattern ..... dis 20&10 %
Scovill Pattern, Handled ..... dis 25 %
Hick's Pat. Solid C. S. Planters ..... dis 20&10 @ 30 %
" Scovill Pattern dis 20&5 @ 35 %
Winsted & Lane, Planters ..... dis 25 %
" Scovill Pattern

Rail.
Sliding Door Wrought Brass..... ₩ ℔ 43c dis 30 %
" " Iron, Painted .. ₩ foot 4c. dis 10&10 %
Barn Door....Inch..... ⅜ ½ ⅝
Per 100 feet. $2.00 3.00 5.00—dis 10 %
" for N. E. Hangers—
Small. Med. Large.
Per 100 feet. .. ..$2.10 2.70 3.30—net

Razors.
J. R. Torrey Razor Co.....dis 15 %

Razor Strops.
Genuine Emerson.....dis 60@65 %
Badger's Emerson.....dis 60@65 %
Badger's (not Emerson).....dis 33⅓ %
Evans'.....dis 40 %
Imitation Emerson..... ₩ doz $2.00. dis 20 %
Hunt's. .....dis 40&5 %
Chapman. .....dis 15@20 %
Saunder's.....dis 10 %
Torrey's .....dis 20 %

Rivets.
Iron and Tinned.....dis 65 %
In bulk, list of May 21.....dis 45⅔ %
Copper Rivets and Burs.....dis 33⅓ %
Nos.. 7 8 9 10 11 12 13 14 15 &c
₩ ℔..490 500 520 540 560 580 600 650 700&c
Burr's.....dis 45 %

Rivet Sets.....dis 40 %

Rods.
Stair, Brass.....dis 25 %
Stair, Black Walnut.....dis 40 %
Stair, Amer can Patent .....dis 20 %

Rollers
Barn Door, Sargent's list.....dis 60&10&10 %
Acme (Anti-Friction).....dis 50%
Rope.—Mnis' Net List, Oct. 5, 1881, dis on 5000 lbs ℔ and over, 1½c ₩
Manila.....½ inch and larger' ₩ 16
" .....⅜ inch ₩ ℔ 18½c
" .....¼ and 5-16 inch ₩ ℔ 17 c
" Tar'd Rope.....₩ ℔ 14½c
" " Lath Yarn.....₩ ℔ 12½c
" Hay Rope.....₩ ℔ 16 c
Sisal.....½ inch and larger ₩ ℔ 10½c
" .....⅜ inch ₩ ℔ 11 c
" .....¼ and 5-16 inch ₩ ℔ 11½c
" Hay Rope.....₩ ℔ 8½c

Rules.	Boxwood.	Ivory.
Trapath's, Standard, Stanley	dis 60&5&10 %	dis 5&10 %

Sad Irons.
From 4 to 10 lbs.....₩ ℔ 3½c net
Self Heating.....₩ doz $9.00 net
" Tailors'.....₩ doz $18.00 net
Gleason's Shield and Toilet.....dis 25 %
Mrs. Pott's Irons, Double Pointed.....dis 40 %
Mrs. Pott's Irons, Square Back.....dis 45 %
Enterprise Star Irons.....dis 45 %
Combined Fluter and Sad Iron..per doz $18.00, dis 15 %

Sand Paper.
Bieder & Adamson's Flint, 00 to 1½..$1.75 ₩ ream
" " " 2, 2½ & 3. 6.25 ₩ ream
" " " Assorted 4.75 ₩ ream
" " Star.....3.75 ₩ ream
" " Emery..₩ ream $6.50 @ 11.50
(dis 35&5 %)
Parties Flint, same list as B & A.....dis. 25%
" Harrison, $3.75 per ream.....dis 25%
New England, same list as B. & A. Flint.....dis 30 %
Gage's.....dis 30& 5%

Sash Cord.
Common.....₩ ℔ 16c net
Patent.....₩ ℔ 18c net
Silver Lake Hemp.....₩ ℔ 20c. dis 10 %
White Cotton.....₩ ℔ 20c. dis 10 %
Drab Cotton .....₩ ℔ 15c. dis 10 %
Raw Hide.....dis 25 %
Steel Ribbon.....dis 10 %

Sash Locks.
Clark's, No. 1, $10.00; No. 2, $8.00 per gross.....dis 33⅓%
Ferguson's.....dis 33⅓ %
Walker's.....net
Hammond's Window Springs.....dis 25 %
Northup Window Springs, No. 1, $10.00; ₩ gross.dis 15 %
The Perfect, Clark & Smith, Plain Jap'd ₩ gro $10.00 net
" " For Knob Jap'd. ₩ gro 14.00 net
" " Nickel-Plated...₩ gro 27.00 net
Universal .....dis 30 %

Sash Weights.—Solid Eyes, in 500 ℔ lots and over.....₩ ℔ 1¾c net

Sausage Stuffers or Fillers.
Miles.....₩ doz, No. 15; No. 0, $21, dis 30 %
Perry.....each $30.00, dis 20 %
Straw Cut No. 4.....dis 30 %
Enterprise Mfg. Co.....dis 25%
Silver's.....

Saws.
Disston's Circular.....dis 40 %
" Mill.....dis 40 %
" Cross Cut.....dis 40 %
" Hand, Panel, Rip, &c.....dis 20 %
Boynton's Lightning, Cross Cuts, new list.....dis 20 %
" One-Man, all lengths, " .....dis 20 %
" Billet Webs, 30 in. " .....dis 25 %
" Lightning Buck Saws X Par.....dis 25 %
" Lightning Hand, Panel and Rip.....dis 25 %
Wheeler & Clemson Mfg. Co.'s Hand.....dis 20 %
W. M. & C. Mfg. Co. Cross-Cuts, except Monarch, dis 20 %
Livingston's Butcher and Kitchen.....dis 20 %
" Framed Wood—
Nos.... 101 102 103 104 105
Per doz..$10.00 8.40 10.00 7.50 6.25 net

Saw Frames.
White, Vermont.....₩ doz $1.35, dis 25 %
Red, Polished and Varnished.....₩ doz $2.00, dis 10 %
Saw Rods.....$10 list dis, 20&&5 %

Saw Sets.
Boynton's Patent X Cut, per doz. $12.00; Hand Saw, per doz.. $10.00.....dis 20 %
Stillman's Genuine.....₩ doz $3.40 and $4.40 dis 10 %
" Imitation.....₩ do $2.25, dis 10&10 %
Common Lever.....per doz $2.00, dis 30&10 %
Leach's.....No. 0, $8.00; No. 1, $15.00, dis 15 %
Nash's.....No. 1 $8.50; No. 2, $6.50, dis 20&10 %
Hammer, Hotchkiss.....$6.50, dis 10 %
" Bemis & Call Co.'s New Pat.....dis 30&5 %
Bemis & Call Co.'s Lever & Spring Hammer..dis 30&5 %
" " Plate.....dis 10 %
" " Cross Cut.....dis 12½ %
Aiken's Genuine.....$13.00. dis 50&10 %
" Imitation.....$7.00. dis 50 %
Hart's Patent Lever.....dis 20 %
Disston's.....dis 20 %
Morrill's.....No. 1, $15; No. 2, $12, dis. 40 %

Scales.
Hatch, Counter, No. 171.....₩ doz $36. dis 35&10 %
" Tea, No. 161.....₩ doz $15.00 dis 40&10 %
Union Platform.....$6.00. dis 45 %
Fairbanks'.....dis 20 %
Buffalo Scale Co.....dis20&5 %
Forsyth Scale Co.....dis 20%
Howe's.....dis 20&5 %
Chatillon's Grocers'.....dis 45 %
" Eureka.....dis 25 %
Family Universal.....dis 50 %
" Favorite .....dis 30 %
" Turnbull's .....dis 40 %
Scale Beams, Chatillon's list.....dis 25 %
" Sargent's list.....dis 50&10 %

Scrapers.
Adjustable Box Scraper (S. R. & L. Co.), $6.40.dis 20&10 %
Box, 1 Handle.....₩ doz $1.00, dis 10 %
" 2 " .....₩ doz 5.00 dis 10 %
Defiance Box and Ship.....dis 20&10 %
Foot.....dis 55 %
Ship (common).....per doz $1.00 net
" (Providence Tool Co.....dis 10%

Screw Drivers.
Douglass Mfg. Co.....dis 20&10&10 %
Disston's.....dis 40 %
Disston's Patent Excelsior.....dis 40 %
Buck Bros .....dis 25 %
Stanley Rule & Level Co's, Varnished Hdls..dis 50&10 %
" " " Black Handles...dis 40&10 %
Sargent & Co.'s.....dis 40&10 %
Gay's Double Action Ratchet per doz., 4 in., $9.00; 5 in., $10.20; 6 in., $12.00 dis 30 %
Cowles Hdw. Co., No. 1 Extra.....dis 40&10 %
" " No. 1.....dis 50&10 %
" " Nos. 4 and 60.....dis 30 %
Clark's Patent.....dis 25 %

Screws.
Flat H'd Iron.....New list April 27, 1881.....dis 35 %
Round Head Iron.. " " .....dis 30 %
Flat Head Brass... " " .....dis 35 %
Round Head Brass " " .....dis 25 %
brass and Silver Capped.....dis 35 %
Japanned, list of Plain Scr ws.....dis 25&10 %
Coach Patent Gimlet Point, List per 100....dis 60&10 %
Coach, Common.....dis 60&10 %
Bed.....dis 10 %
Machine, Flat Head, Iron.....dis55 %
" Round Head, Iron, " " .....dis 50 %
Bench, Iron.....dis 60&10 %
" Wood, Beech.....₩ doz $3.00, dis 10 %
" " Hickory.....dis 20&10 %
Hand.....dis 25&10 %
Hand Rail, Sargent's.....dis 66⅔&10 %
" " Humason, Beckley & Co's .....dis 50 %
" " Am. Screw Co., list of Jan. 1, '81.dis 60&10 %
Jack (Wilson's).....dis 25 %

Screw Window Balances.
R. B. Huguenin's.....$30.00 per gross, dis 25&5 %

Scroll Saws.
Lester, $10.00.....dis 20 %
Rogers, $3.50.....dis 25 %

Shears and Scissors.
American (Cast) Iron.....dis 70&10 %
Clipper Cast Iron.....dis 70&10
Pruning.....see Pruning Hooks and Shears.
Barnard's Lamp Trimmers.....₩ doz $5.75
Tinners'.....dis 15 %
Seymour's, List, Nov. 25, 1879.....dis 60&10 %
Beinsch's " " .....dis 60 %
" Tailors' Shears.....dis 33⅓ %
Mass. Cutlery Co. St. Trimmers.....dis 75 %

Shovels.
Sliding Door, M. W. & Co., list.....dis 45&2 %
" R. & E. list.....dis 60&10&2 %
" Patent Molier.....dis 10 %
" " Hatfield's .....dis 60&10&2½ %
" Russell's Anti-Friction .....dis 60&10&2 %
" Moore's Anti-Friction.. .....dis 45 %
Sliding Shutter, R. & E. list.....dis 60&10&2 %
" " Sargent's list.....dis 60&10 %
" " Reading list.....dis 55&10 %
Moore's Anti-Friction (Hanging).....dis 45

Shovels and Spades.
Ames. New list, July 1, 1881.....dis 15 %
Griffiths.....dis 10 %
Old Colony.....dis 15%
Payne Pettebone & Son, new list,.....dis 40&10 %
" " R. R. Shovels .....dis 15 %
Remington's (Lowman's Patent).....dis 30 %
Rowland's.....dis 40&10 %

Shovels and Tongs.
Iron and Brass Head, R. & E. list.....dis 60&10&2 %
Polished Steel .....new list. dis 50&10&2 %

Slates.
Square Frames.....by case.....dis 70 %
Less than a case.....dis 66&10 %

Spoke Shaves.
Defiance Metallic.....dis 20&10 %
Iron.....dis 45 %
Wood.....dis 30&10 %
Bailey's (Stanley R & L. Co.) new list..... dis 30&10 %
Stearns'.....dis 30&10 %

Spoke Trimmers.
Bonney's.....₩ doz $10.00 dis 40&5 %
Stearn's.....₩ doz $9.00 dis 20&10 %
Ives'.....No. 1, $15.00; No. 2, $12.00 ₩ doz, dis 50&10 %
Douglass'.....₩ doz $9.00. dis 15 %

Spoons.
Basting.....dis 60&10&10 %
Riveted Table and Tea.....dis 55 %
Solid Table and Tea.....dis 55 %
Britannia.....dis 65&5 %
Reed & Barton.....dis 40&5&2 %
Hall & Elton.....dis 40&5&2 %
Holmes, Booth & Haydens.....dis 40&5&2 %
German Silver.....dis 20&10&5 %
Cast Steel, Sil. Plated.....dis 33⅓ %
Tin (P. S. & W.), Teas.....$1.25 ₩ gross, net
" " Tables.....$2.00 ₩ gross, net
Tin Cowles Hdw. Co.).....dis 10 %
" " " case lots.....dis 20 %

Stocks and Dies.
" Lightning " Screw Plate.....dis 10 %

Stone.
Hindostan No. 1, 6 c; Axe, 8c.....dis 20&10 %
Hindostan Hacker Stone.....₩ gross $12.00 dis 10 %
Sand Stone.....₩ ℔ 6c dis 33⅓&10 %
Washita Stone.....No 1, ₩ ℔ 20c net
" .....No 2. ₩ ℔ 16½c net
" Slips.....No. 1, ₩ ℔ 40c net
Arkansas Stone No. 1, 4 to 6 in.....℔ ₩ $1.35 net.
" No 1, 6 to 9 in.....℔ ₩ $2.00 net
Turkey Oil Stone (Chase).....4 to din, $1.00 ₩ ℔,
" Slips .....$2.50 ₩ ℔ dis 10 %
Lake Superior (Chase).....₩ ℔ 20c, dis 10&5 %
" " Slips " .....₩ ℔ 45c, dis 10&5 %
Grindstones, Family, Loring's.....dis 10 %

Stove Polish.
Joseph Dixon's.....₩ gross $6.00 dis 10 %
Gem.....₩ gross $4.50, dis 10 %
Gold Medal.....₩ gross $6.00, dis 25 %
"Mirror".....₩ gross $6.00, dis 5 %
Rub'e.....₩ gross $1.75, net
Rising Sun.....₩ gross $1.75, net
Dixon's Plumbago.....₩ ℔ 8c. net

Squares.
Steel.....dis 50 %; full cases, dis 50&10 %
Iron.....dis 50 %; full cases, dis 50&10 %
Nickel Plated.....add $2.50 @ $4.00 ₩ doz. list
Try Squares and T Bevels.....dis 50&10
Disston's Try Square and T Bevels.....dis 40 %
Winterbottom's Try and Mitre.....dis 20&10 %

(2 % cash)

Tacks, Brads, &c.
List of April 2, 1880
Tinned Swedes Tacks.....dis 10 %
Tinned American " .....dis 60 %
Swedes Tacks, all kinds.....dis 40 %
Copper Tacks and Nails.....dis 33⅓ %
Swedes Hungarian Nails .....dis 33⅓ %
Gimp and Lace Tacks.....dis 33⅓ %
" " Tinned .....dis 60 %
Finishing Nails.....dis 35 %
Trunk and Clout Nails.....dis 35 %
Common and Patent Brads.....dis 30 %
Basket Nails .....dis 25 %
Brush Tacks.....dis 25 %
Leathered Carpet Tacks.....dis 30 %
American Cut Tacks.....dis 33⅓ %
Cigar Box Nails.....dis 33⅓ %
Chair Nails.....dis 33⅓ %
Double-Pointed Tacks .....dis 40&5 %

(Extra 10 % on all.)

Tap Borer
Common and Ring.....dis 20 %
Ives' Tap Borers.....dis 15&10 %
Enterprise Mfg. Co.....dis 30 %

Tapes. Measuring.
American.....dis 20 %
Spring Tapes.....dis 25&10 %

Thermometers.
Tin Case .....dis 75&10 %

Tobacco Cutters.
Enterprise Mfg. Co. (Champion).....dis 25 %
Wood Bottom.....₩ doz $12.00, dis 40&5 %
All Iron.....₩ doz $9.40, dis 40&5 %
Nashua Lock Co.'s.....₩ doz $18 00, dis 50@55 %
Wilson's.....dis 35 %
Toe Calks.—Winsted.....₩ ℔ 9c. dis 5

Tinners' Tools and Machines.
Machines (P. F. & W.).....list add 20 %
Tools (P. S. & W.).....add 6 %

Transom Lifters.
Wollensak's Patent.....dis35 %
Richer's Patent.....dis 20&10&10 %
Excelsior.....dis 50&2&2 %

Traps.
Game, Newhouse.....dis 35 %
" Oneida Pattern.....dis 40 @ 55 %
" Blake's Patent.....dis 40 %
Mouse, Wood, Choker.....₩ doz holes, 16½c
" Round Wire.....₩ doz $1.50, dis 10 %
" Cage " .....₩ doz $2.50. dis 10 %
" Catch-em-alive.....₩ doz $2.50, dis 10 %
Rat, "Decoy".....per doz $10.00, dis 10 %

Trowels.
Lothrops Brick and Plastering.....dis 25 %
Reed's Brick and Plastering.....dis 15 %
Disston's Brick and Plastering.....dis 20 %
Peace's Plastering.....dis 30 %
Clement & Maynard's.....dis 20 %
Rose's Brick.....dis 15 %
Brades' Brick.....dis 20 %
Worrall's Brick and Plastering.....dis 20 %
Garden.....dis 50&10 %

Triers.
Butter and Cheese.....dis 25%

Vises.
Solid Box.....List of July 1, '79 dis 35 %
" "Crown" (A. H. Hildick) 40 to 100 ℔, 15c net
" Peter Wrights.....15½c
" Wilkinson's.....13½c
Parallel, Parker's.....dis 10 %
" Wilson's.....dis 35 %
" Howard's.....dis 20&10 %
" Merrill's.....dis 15 %
" Sargent's.....dis 60&10 %
" Trenton.....dis 30 %
" Backus and Union.....dis 40 %
" Oval Slide.....dis 40 %
" Double Screw Leg.....dis 15&10 %
" Prentiss.....dis 25 %
" Simpson's Adjustable.....dis 25 %
"Family." List.....net
Saw Filers, Bonney's.....₩ doz $24.00, dis 20&10 %
" Stearn's.....dis 20&10 %
" Hopkins'.....₩ doz $17.00 dis 10 %
Reading.....dis 40&10 %
Lowell Hand Vises.....dis 20 %
Richardson's Vise and Anvil.....dis 25 %

Washer Cutters.
Smith's Patent .....₩ doz $12.00 dis 25 %
Johnson's.....₩ doz $12.00. dis 33⅓ %
Penny's.....₩ doz $14.00 and $16.00. dis 55 %
Appleton's.....₩ doz $16.00, dis 60&10 %

Washers.—See Nuts and Washers.

Well Wheels.....dis 60&10&10 %

Wire.
Brass and Copper... List of June 10, 1880.....dis 30 %
Bright and Annealed.....Nos. 0 @ 18. dis 50@52½ %
" " .....Nos. 19 @ 20. dis 60 %
" " .....Nos. 27 @ 36. dis 60 %
Coppered.....Nos. 0 @ 18. dis 45@47½ %
Galvanized, Nos. 0 to 18.....market list. dis 40@45 %
Tinned, Nos. 0 to 18.....dis 40@45 %
Cast Steel.....dis 40 %
Tinned Broom Wire, Nos. 18 to 25.....dis 55 %
Annealed Fence, Nos. 8 and 9 .....dis 50@52½ %
" Grape, Nos. 10 to 14. .....dis 50@52½ %
Galvanized Telegraph, Nos. 7 to 9 .....₩ ℔ 9c
" Nos. 10 and 11.....₩ ℔ 10c
" No .....₩ ℔ 10½c
Fence Staples.....₩ ℔ 8½ @ 9½c
" Staples, Galvanized.....₩ ℔ 7 @ 7½c
Stubs Steel Wire.....$7.00 to 8
Japanned Barb Fence. .....₩ ℔ 10c
Galvanized .....₩ ℔ 11c
Steel Music Wire, Nos. 12 to 27.....₩ ℔ $1.25 net
Turner & Seymour Mfg. Co. Picture Wire..dis 80&20 %
Judd's Picture Wire.....dis 80&20 %
Clothes Line Wire, Galvanized.....₩ coil 26@400 net
Wire Cloth, green and drab.....₩ sq. ft, 3 c net

Wrenches.
American Adjustable.....dis 45 %
Baxter's Adjustable "S,".....list Jan., 1880. dis 20&5 %
" Diagonal.....dis 20&5 %
Coes 'Genuine.....dis 5 &3 %
" "Mechanics".....dis 55&10 %
" Pattern, Malleable.....dis 75 %
" " Wrought.....dis 65 %
Girard Standard.....dis 60 %
Girard Agl. .....70&5 %
Bemis & Call's Patent Combination.....dis 20%
" " Merrick's Pattern.....dis 35 %
" " Briggs' Pattern .....dis 25 %
" " Cylinder or Gas Pipe.....dis 40 %
Van Wagoner & Williams' Basin .....per doz $4.50
Aiken Pocket (Bright).....$6.00, dis 60&10 %
The Favorite Pocket (Bright).....per doz $8, dis 60 %
Webster's Pat. Combination.....dis 25 %

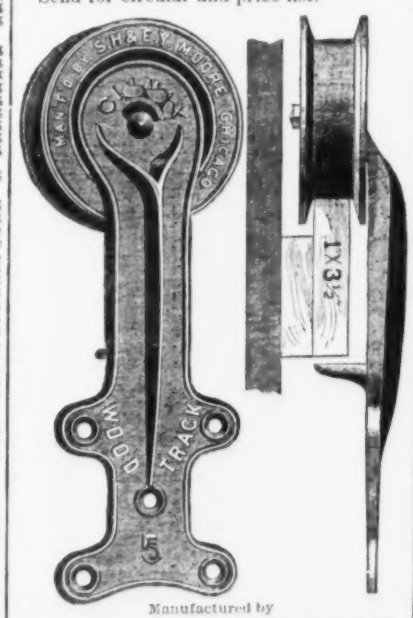
Wringers. Per doz

Universal, XX	No. 2½	$6.00
" "	No. 2	6[illegible]
" "	No. 1½	7[illegible]
" "	No. 1	9[illegible]
" "	No. 0	11.00
" "	No. 12	20.00
" "	No. 18	26.00
" "	No. 22	32.00
Peerless, No. 0,	no Cogs	51.00
"	No. 1	54.00
"	No. 2½, with Cogs	60.00
"	No. 2, "	64.00
"	No. 3, "	71.00
"	No. 4, "	89.00
Unique,	No. 0	51.00
"	No. 1	54.00
Novelty, No. 2		60.00
Excelsior, No. A.		78.00

(Extra 10 % on all.)

MERCHANT & CO.,
Importers of
TIN PLATE,
PHILADELPHIA, PA.

S. H. & E. Y. MOORE,
163 and 165 LAKE ST.,
CHICAGO,
AGENTS FOR
PROVIDENCE TOOL CO.,
Reading Bolt and Nut Works,
Syracuse Bolt Company,
Hotchkiss & Gaylord,
Wm. H. Haskell & Co.,
Saranac Horse Nail Co.,
Black Diamond File Works,
J. M. Carpenter, Taps and Dies,
Penfield Block Company,
MANUFACTURERS OF
Nuts, Bolts, Washers,
Gimlet Point Coach Screws,
Endless Chain, Ice Chain,
Threshing Machine Teeth,
Turn Buckles, Tackle Blocks,
Ship Chandlery, Hardware,
Files, Taps, Wood Screws,
Rivets, &c. Also,
"CLIMAX"
BARN DOOR HANGERS
For Wood Track.
Send for circular and price list.



Manufactured by
S. H. & E. Y. MOORE,
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DAVID BLOCK,
Manufacturer of
Plain, Stamped & Japanned
TIN WARE.
Block's Tin Spout Strainer & Patent O. K. Grater.



BLOCK'S STRAINER
Office and Salesroom,
65 & 67 BAYARD STREET,
Factory, 139 & 141 Centre St., NEW YORK.

FOUNDRYMEN'S METALLIC
Pattern Letters and Figures,
To put on patterns of castings. All sizes. Reduced prices. Mnfd. by H. W. Knight Seneca Falls, N.Y.

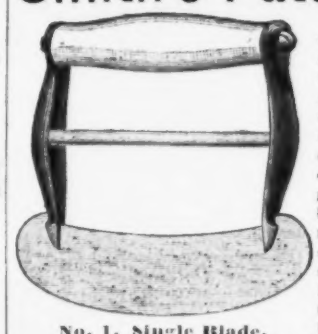
NEW ENGLAND BUTT CO.,
Manufacturers of
Drilled Cast Butt Hinges
IN GREAT VARIETY.
New England Gate Hinges. Sad Irons, Polishing Irons.
Woolman's Self-Closing Gate Hinges. Mrs. Cook's, McCoy's and New England Polishing Iron
Barn Door Hangers, Rolls & Rail. Laundry and Tailors Irons.
Sliding Door Rolls and Way. Tailors' Box Irons.
Butterworth Window Springs. Detachable Handle Sad Irons.
Grindstone Fixtures. Waffle Irons.
Patent Saw Clamps. Foot Scrapers.
Patent Floor Jacks. Patent Foot Scraper and Cleaner.
Cistern Tops and Covers. Braiding Machinery for Silk, Worsted
Stair Rail, Store and Fancy Brackets. or Cotton, and for covering
Harness Hooks and Brackets. Whips and Telephone Wire.
Flush Pulls, Small Anvils, Dumb Bells. Fine Castings a specialty.
WORKS AT PROVIDENCE, R. I.
New York Office, - - - 99 Chambers Street.
BOSTON AGENTS—NASHUA LOCK CO.

CHAS. G. SHEPARD WALTER J. SHEPARD
SHEPARD HARDWARE CO.
BUFFALO, N.Y.
SOLE MANUFACTURERS OF
Shepard's Patent "Noiseless" Blind Hinge.

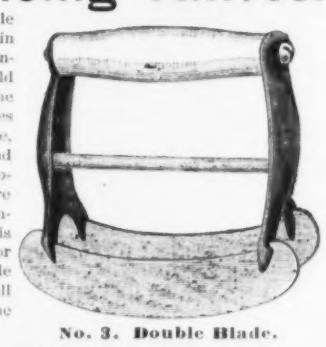


SEND FOR ILLUSTRATED CATALOGUE.

Smith's Patent Mincing Knives.


No. 1. Single Blade.

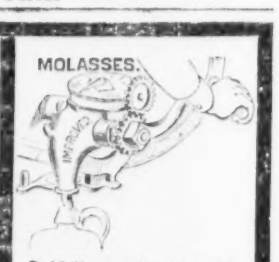
These Knives are made of the best Steel and in a most thorough manner. The blades are held at full tension by the screw, which passes through the handle, drawing the upper end of the side pieces together over the wire brace, in the same manner as a wood saw is strained up for use. For sale by the Wholesale Hardware Trade in all the Leading Cities of the United States.


No. 3. Double Blade.

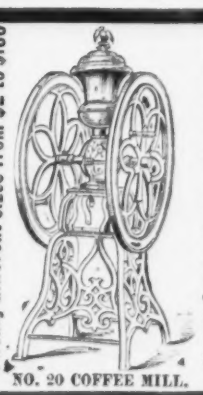
C. E. JENNINGS & CO., Sole Proprietors,
96 Chambers St., NEW YORK.


Fruit, Wine & Jelly Press.


SAUSAGE STUFFER.



Self-Measuring Faucet.



NO. 20 COFFEE MILL.

ENTERPRISE MANUFACTURING CO. OF PA.,
THIRD & DAUPHIN STS, PHILADELPHIA, PA.

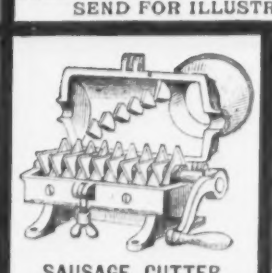

MRS. POTTS' Cold Handle Double Pointed Sad Irons.

Tincture Presses, Self-Weighing Cheese Knife, Cork Presses.

THE BEST ARE THE CHEAPEST.

SOLD BY HARDWARE DEALERS.
SEND FOR ILLUSTRATED CATALOGUE, FREE.


Smoked Beef Shaver.


SAUSAGE CUTTER.


Bung Hole Borer.
Tobacco & Root Cutter.

Elizabethport Steam Cordage Co.,
MANUFACTURERS OF MANILA, SISAL AND TARRED
CORDAGE OF ALL KINDS.
BINDER TWINE A SPECIALTY.
E. M. FULTON.
D. B. WHITLOCK.
A. W. LUKENS.
46 South Street, New York.

CHAINS. S. WOODHOUSE, Newburg, Ohio,
Hand-made COIL, CABLE AND BLOCK CHAINS.
Send for prices.

NEW YORK WHOLESALE PRICES, November 2, 1881.

METALS.

IRON.—DUTY Bars, 1 to 1½c ₩ lb; Sheet, Band Hoop and Scroll, 1¼ to 1½c. ₩ lb; provided, that none of the above iron shall pay a less rate of duty than 35 per cent. Pig, $7 ₩ ton; Polished Sheet, 3c. ₩ lb; Wrought Scrap, $8 ₩ ton; Cast Scrap, $6 per ton. Railroad 70c. ₩ 100 lbs. Boiler and Plate, 1½c. ₩ lb.

Iron—AMERICAN

Foundry No. 1X	₩ ton	$25.00 @ 26.00
" No. 2X	₩ ton	23.00
Gray Forge	₩ ton	21.00 @ 21.50

SCOTCH.

Eglinton	₩ ton	23 50 @ 24.00
Carnbroe	₩ ton	24.75
Coltness	₩ ton	26.50
Glengarnock	₩ ton	25.00
Gartsherrie	₩ ton	25.00 @ 25.50
Summerlee	₩ ton	26.00

Rails.

Iron	₩ ton	$48.00 @ 50.00
Steel (at mill) (1882 delivery)	₩ ton	60.00
Old Rails T2	₩ ton	28.50 @ 29.00
Old Rails D H	₩ ton	31.50 @ 32.00

Scrap.

Wrought Scrap ₩ ton, from yard 32.50

Bar Iron, from Store.—

Common Iron:

⅜ to ⅞ in. round and square	₩ lb 2 70
1 to 6 in. x ⅜ to 1 in.	₩ lb 2 70

Refined Iron

⅜ to 2 in. round and square	₩ lb 2.90
1 to 6 in. x ⅜ to 1 in.	₩ lb 3.10
1 to 6 in. x ¼ and 5-16	₩ lb 3.10
Rods—⅜ and 11-16 round and square	₩ lb 3.00
Bands—1 to 6x3-16 to No. 12	₩ lb 3.40
Norway Nail Rods	6¼ @ 6½c

Sheet Iron.

	Common American	R. G. American.
Nos. 10 to 20	₩ lb 4	5
" 21 to 24	₩ lb 4¼c	5
" 25 to 26	₩ lb 5 c	5¼
" 27	₩ lb 5 c	5¼
" 28	₩ lb 5¼c	5½

	B.B.	2d qual.
Galvanized, 10 to 20	₩ lb 8½c	7½c
" 21 to 24	₩ lb 9½c	8 c
" 25 to 26	₩ lb 10 c	8½c
" 27	₩ lb 10½c	9 c
" 28	₩ lb 11½c	9½c

Patent Planished ₩ lb 10½c; B 9½c
Russia 11 @11½c
American Cold Rolled ₩ lb 5 @7½c

COPPER.—DUTY Pig, Bar and Ingot, 4c; Old Copper 4c lb; Manufactured (including all article of which Copper is a component of chief value), 45 % ad valorem.

American Ingot ₩ lb See Trade Report

SHEATHING BRAZIERS COPPER, BOLTS, &c.

Braziers' Copper, ordinary sizes, 16oz. per sq. ft., and over per lb 28c
Braziers' Copper, ordinary sizes, under 16 oz. and over 12 oz., ₩ sq. ft. ₩ lb 30c
Braziers Copper 10 oz and 12 oz., ₩ sq. ft. ₩ lb 32c
" Lighter than 10 oz. ₩ sq. ft. ₩ lb 34c
Circles less than 24 in. in diameter ₩ lb 31c
Circles 24 in. diameter and over ₩ lb 34c
Segment and Pattern Sheets ₩ lb 31c
Locomotive Fire Box Sheets ₩ lb 26c
Sheathing Copper, over 12 oz. ₩ sq. ft. ₩ lb 26c
Bolt Copper ₩ lb 28c
Copper Bottoms ₩ lb 29c

No Copper is Sheathing except 14x40 inches and not to exceed 34 oz. to the sq. ft.

TINNING.

4x8 ₩ sheet 6c

All other size Sheets, 2½c. per square foot.

For tinning both sides, double the above amount

O'NEILL'S PATENT PLANISHED COPPER.—Not.

14x48

24 and 16 oz. and heavier	₩ lb 34c	By the case	₩ lb 33c
22 oz. and lighter	₩ lb 37c	" "	₩ lb 36c

Boiler Sizes.

7 in., 14x52. 8 in., 14x56. 9 in., 14x60. and 16 oz. and heavier. ₩ lb 36c By the case. ₩ lb 35c

(And all sizes not over 20 in. wide.

24x48x30x60.

24 and 16 oz. and heavier	₩ lb 38c		
22 oz.	₩ lb 41c		

Brass.

Brown & Sharp's Gauge the Standard for Metals. Old English Gauge the Standard for Wire.

BRASS MANUFACTURERS' PRICE LIST.—dis. Nominal. June 10, 1880.

Cash prices for Roll and Sheet Brass. For less quantity than 100 lbs. add 30 ₩ lb.

HIGH BRASS.

All Nos. not thinner than to No. 28, wider than 2 in., not wider than 14 in. 30c
All Nos. to No. 28, inclusive, and widths over 14 to 20 in., inclusive 34c
All Nos. to No. 28, inclusive, and widths over 20 to 30 in., inclusive 38c
½c ₩ lb advance on each No. above Nos. 28 to 38, inclusive.
All Brass thinner than No. 8 is Platers' Brass, at 43c
Sheets 24x48, and all sheets cut to particular sizes and lengths under 30 in., in width wider than 2 in. 37c
Printers' Rules 45c
Sheets wider than 30 in. and under 40 in. 47c
" 40 in and over 60c
Circular Sheets, in diam. from 4 in. to 14, inclusive 30c
" " over 14 " 20, " 45c
" " " 20 " 30, " 40c
" " " 30 " 40, " 45c
" " 40 in 50c

LOW BRASS.

4c ₩ lb more than High Brass.

Gilding Metal, 8c ₩ lb more than High Brass.

Platers' or Gold Metal { In Bars 48c; Sawed 51c; Planed or Polished 54c

FOR SLITTING.

Metal in width 1 in. to ¼ in. to No. 28, inclusive, 1c. ₩ lb advance.
Metal, in width 2 in to 1 in. thinner than No. 28, 2c. ₩ lb advance.
Metal, in width 1 in. to ¼ hinner than No. ₩ lb advance.
Metal, in width ¼ in. to ¼, inclusive, not thinner than No. 28, 2c. ₩ lb advance.
Metal, in width ¼ in. to ¼ thinner than No. 28, 4c. ₩ lb advance.
Metal, ¼ in. in width and less, 10c. ₩ lb advance.
Any of the above widths cut to particular lengths, add 7c. ₩ lb.

GERMAN SILVER MARKET METAL AND WIRE

	Market Metal.	Wire.
1 per cent., 12 inch to No. 26	$0.43	$0.70
5 " " "	.56	.76
10 " " "	.64	.88
15 " " "	.74	1.03
18 " " "	.80	1.13

German Silver Sheets over 12in. wide and weighing more than 10 lbs., $2.00 ₩ lb.

Advance 2c. for each additional inch in width above 2 in. and 2c. ₩ lb on each No. thinner than Nos. 26 to 36, inclusive.

All German Silver thinner than No. 36 is Platers, at 50c ₩ lb additional.

Germad Silver Scrap one-half less than net price of 12 in Market Metal. German Silver Turnings, Filings and Chips, half the price of Scrap.

BRASS AND COPPER WIRE.

	High Brass.	Low Brass.	Gild'g and Copper.
No. 0 to 20	$0.35	$0.37	$0.43
No. 21	.36	.40	.46
No. 22	.37	.41	.47
No. 23	.38	.42	.48
No. 24	.40	.44	.50
No. 25	.43	.47	.53
No. 26	.45	.49	.55
No. 27	.48	.52	.58
No. 28	.52	.56	.62
No. 30	.55	.59	.65
No. 32	.58	.62	.72
No. 34	.62	.66	.78
No. 36	.66	.70	.84
No. 38	.70	.74	.93
No 34	.74	.78	1.03

Spring Wire 2c ₩ lb advance.

Flat, Square and Half Round Wire 5c ₩ lb advance on Round Wire.

Fancy Wire not less than 10c ₩ lb advance of Round Wire.

Brass Rods, No. 8 and larger, not less than 2 feet lengths, 38c.

Wire straightened and cut, smaller than No. 8 and not less than 2 feet lengths, 43c.

Wire and Rods less than 2 feet lengths, special rates

Twelve cents per lb extra for spooling on 1 lb spools.

MISCELLANEOUS.

Brass Pail Ears	$0.50
Brass Door Rail	.43

SCRAP.—dis. Nominal.

High Brass Scrap	12c
Low "	14c
Gilding "	10c

Turnings, Filings and Chips half the price of Scrap.

Terms—Net cash. Interest to be added after thirty days.

TUBING.—dis. Nominal.

	₩ lb
Plain No. 2 inclusive above ¼ in. to 3 in.	$0.43
" above 3 in.	.53

Nos. 21, 22, 23, two cents advance on List for each Number.

Nos. 24, 25, 26, four cents advance on List for each Number.

Above No. 26, special rates.

Plain, ¼ inch	.70
" ½ "	1.10
" ¾ "	1.50

All Mandrel Drawn Tubes, 5 cents advance on List Prices.

Fancy Tubing to No 20

English, Scotch and Extra Patterns Fancy Tubing to No. 20

Tubing Sawed or Cut 2 to 4 feet long, 2 cents advance on List.

Add to 2 cent ¼ cent for each additional cutting under 2 feet.

All Mandrel Drawn Tubes under ½ in. 2 cents per pound advance.

RING TUBING—dis 20 %.

Plain	.27
Fancy	.33
Cut and Extra Patterns	2c

GERMAN SILVER TUBING.—dis 10 %

4 Per cent.	80
6 "	.90
9 "	1.0
12 "	1.20
15 "	1.35
16 "	1.45
18 "	1.50
20 "	1.60

STEEL.—DUTY: Bars, Ingots, Sheets and Coils valued at 7 cents ₩ lb., or under, 24¼ cents; over, 7 cents, and not above 11, 3 cents ₩ lb; over 11, 3½ cents ₩ lb, and 10 % ad val. Railway Bars, 1¼ cents ₩ lb. Railway Bars, in part Steel, 1 cent ₩ lb. Provided, that Metal cemented, cast or made from Iron by the Bessemer or pneumatic process, of whatever form or description, shall be classed as

American Cast Steel.

For American Steel see quotations under heading of Pittsburgh.

English Steel.—

"	Best Cast	₩ lb 15½c
"	Extra Cast	₩ lb 16½c
"	Round Machinery, Cast	₩ lb 10c
"	Swaged, Cast	₩ lb 18c
"	Best Double Shear	₩ lb 15½c
"	Blister, 1st quality	₩ lb 13c
German Steel, Best		₩ lb 11c
"	2d quality	₩ lb 10c
"	3d quality	₩ lb 9c
Sheet Cast Steel, 1st quality		₩ lb 15½c
"	2d quality	₩ lb 14½c
"	3d quality	₩ lb 12½c

ANTIMONY See Trade Report

LEAD.—DUTY Pig $2 ₩ 100 lbs; old Lead, 1½c ₩ lb Pipe and Sheet, 2½c ₩ lb.

American	5½ @ 5¾c
Bar	.00 net
Pipe	7½c dis 10 %
Tin Lined Pipe	14c. dis 10 %
Sheet	6c. dis 5 %
New Canton Flannels	5¾ @ 6¼
New Seconds, light	3¾ @ 4
" dark	3½ @ 3¾
No. 2, Whites	2½ @ 3
Cotton Canvas	4¾ @ 4½
Linen Canvas, No. 1	4 @ 4½
Seconds, City No. 1	1¼ @ 1¾
" No. 2	1¼ @ 1¾
Colors, per 100 lbs	75 @
Manilla Rope	3¼ @
" Tarred	2½ @ 2¾
Gunny Bagging, No. 1	2½ @ 2¾
" No. 2	1¾ @ 2
Kentucky Bagging	4¼ @ 4½
Burlap Bagging, No. 1	2¾ @ 3
Tar Shakings	2¼ @ 2½
Hemp Twine Stock	4½ @ 4¾
Hard White Shavings, No. 1	4¼ @ 4½
Soft White Shavings, No. 1	3¾ @ 4
White Shavings, No. 2, soft	3¼ @ 3½
Mixed Shavings, part white	2¾ @ 3¼
Ledger and Writing	3¼ @ 3½
Solid Stock	3¼ @
Book Stock No. 1, light	1¼ @ 1½
Old Newspapers	1¾ @ 2
Pure Manilas	2¼ @ 2¾
Bogus Manilas and Hardwares	1½ @ 1¾
Commons	90 @
Binders' Board Cuttings	1¼ @ 1¾
Straw Board Cuttings	1¼ @ 1¾

Frostings	40c
Glue, White	24 @ 35c
" Sheet	30c
Glaziers' Points, Zinc	6c
Gum, Copal	36c
" Damar	24c
" Shellac, English	44c
" " dark	40c
Litharge, English	7½c
Pumic Stone, selected Lumps	4 @ 6c
" powdered	3½c
Pine Tar, bbls	$3.50
Pitch	$2.50
Putty, in bladders	3 c
" in bulk	2½c
Rosin—Common and Good—Strained	$2.25
E & F	$2.55 @ 2.65
G & H	$2.70 @ 2.85
I & K	$3.10 @ 3.30
M & N	$3.80 @ 4.10
Spirits Turpentine	54 @ 55c
Whiting Spanish	90c
Waste, No. 1 Cop	10c
" No. 1 White Machine	10c
" No. 2 "	9½c
" No. 1 Colored	7c
" No. 2 "	6½c
" Washed Machine	9c

Glass.

FRENCH WINDOW GLASS.

Prices current per box of 50 feet.

Single Thick.—Discount 50 & 10.

SIZES.	1st.	2d.	3d.	4th.
6 x 8 to 10 x 15	$ 6.50	$ 5.75	$ 5.50	$ 5.25
11 x 14 to 16 x 24	7.25	6.75	6.25	6.00
18 x 22 to 20 x 30	9.25	8.50	7.75	7.25
14 x 36 to 24 x 36	10.25	9.25	8.25	
26 x 28 to 24 x 36	11.00	10.00	9.00	
26 x 36 to 26 x 44	11.75	10.75	9.50	
26 x 46 to 30 x 50	13.25	12.50	10.50	
30 x 52 to 30 x 54	14.00	13.00	11.25	
30 x 56 to 34 x 56	15.00	13.75	12.50	
34 x 58 to 34 x 60	15.50	15.00	13.25	
36 x 60 to 40 x 60	17.50	16.00	15.00	

Double Thick.—Discount 50 & 10.

SIZES.	1st.	2d.	3d.	4th.
6 x 8 to 10 x 15	$ 8.25	$ 7.75	$ 7.50	$ 7.00
11 x 14 to 16 x 24	10.00	9.25	8.75	8.25
18 x 22 to 20 x 30	12.75	11.75	10.75	
15 x 36 to 24 x 30	14.25	13.00	11.75	
26 x 28 to 24 x 36	15.25	13.75	12.50	
26 x 36 to 26 x 44	16.25	14.75	13.00	
26 x 46 to 30 x 50	17.50	16.75	14.25	
30 x 52 to 30 x 54	18.50	17.25	14.75	
30 x 56 to 34 x 56	19.50	18.25	16.25	
34 x 58 to 34 x 60	20.50	19.50	18.00	
36 x 60 to 40 x 60	23.00	21.00	20.00	

An additional 10 per cent. will be charged for all Glass more than 40 inches wide. Any size over 52 inches in length, and not making more than 81 united inches will be charged in the 84 united inches b cket

Paper Stock, &c.

(Dealers' Selling Pric

White Shirt Cuttings, No. 1	6¼ @ 7
" " No. 2	5 @ 5¼
Mill Assorted Whites	5¾ @ 5¾
Unbleached Muslins	6¾ @ 6¾
City Whites, No. 1	4¾ @
New Canton Flannels	5¾ @ 6¼
New Seconds, light	3¾ @ 4
" dark	3½ @ 3¾
No. 2, Whites	2½ @ 3
Cotton Canvas	4¾ @ 4½
Linen Canvas, No. 1	4 @ 4½
Seconds, City No. 1	1¼ @ 1¾
" No. 2	1¼ @ 1¾
Colors, per 100 lbs	75 @
Manila Rope	3¼ @
" Tarred	2½ @ 2¾
Gunny Bagging, No. 1	2½ @ 2¾
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Kentucky Bagging	4¼ @ 4½
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Tar Shakings	2¼ @ 2½
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Hard White Shavings, No. 1	4¼ @ 4½
Soft White Shavings, No. 1	3¾ @ 4
White Shavings, No. 2, soft	3¼ @ 3½
Mixed Shavings, part white	2¾ @ 3¼
Ledger and Writing	3¼ @ 3½
Solid Stock	3¼ @
Book Stock No. 1, light	1¼ @ 1½
Old Newspapers	1¾ @ 2
Pure Manilas	2¼ @ 2¾
Bogus Manilas and Hardwares	1½ @ 1¾
Commons	90 @
Binders' Board Cuttings	1¼ @ 1¾
Straw Board Cuttings	1¼ @ 1¾

Paints, Oils, &c.

Paints.

Black Lamp, Coach Painters	₩ lb 20c
" Ordinary	6c
" Ivory Drop, fair	12 @ 14c
" best	25c
Black Paint, in oil	Kegs 8c asst'd cans, 11c
Blue Prussian, fair to best	40 @ 55c
" " " in oil	45 @ 55c
Blue Chinese dry	70c
" Ultramarine	18 @ 30c
Brown, Spanish	11c
" Van Dyke	10@12c
Green, Chrome	15 @ 23c
" in oil	14 @ 18 @ 21c
" Paris	good 25c; best, 30c
" in oil	" 30c; 45c
Iron Paint, Bright Red	₩ lb 2½c
" Brown	₩ lb 1½c
" Purple	₩ lb 3c
" Ground in Oil, Bright Red	₩ lb 5½c
" " " Red	₩ lb 5c
" " " Brown	₩ lb 4½c
" " " Purple	₩ lb 6c
Mineral Paints	2 @ 4c
Orange Mineral	10c
Red Lead, American	7½c
" Venetian (N. C.) dry	$1.60 @ $1.70
" in oil	asst'd cans, 11c; kegs, 8c
" Indian dry	9 @ 12c
Rose Pink	10 @ 13c
Sienna, American, Raw	4c
" Burnt	4½c
" " in oil	10 @ 15 @ 20c
" Raw	11 @ 15 @ 25c
Umber, Burnt	4 @ 8c
" in oil	9 @ 12 @ 16c
" Raw	3½ @ 7½c
" " in oil	10 @ 16 @ 18c
Vermillion, Chinese	90c
" English	55 @ 57½c
" Trieste	1.10c
" American, Common	15c
White Lead, American, pure dry	7½c
" " in oil	7½ @ 8c
White, Paris, English, prime	In bbls. 2 @ 2½c
Yellow Ochre, French	$1.75
" " in oil	asst'd cans, 11c; kegs, 8c
" " Vermont	in casks, 1½c
Yellow Chrome	17 @ 27c
" in oil	14 @ 18 @ 25c
Zinc White American No. 1, dry	6½ @ 6¾c
" No. 1, in oil	9c
" French (Paris) dry	8 @ 10c
" " in oil	10 @ 11c

Oils.

Linseed, Raw in casks and bbls	gal. 61 @ 62c
" Boiled "	" 64 @ 65c
Bleached Whale	₩ gal. 105c
" Sperm	₩ gal. $1.15
" Elephant	70c
Signal	75c
Prime Lard	95 @ 98c
No. 1 Extra	80c
West Virginia	14c @ 18c
Drilling	40c
Miners' Oil	40 @ 45c
Fish Oil, pressed	40 @ 45c
Neatsfoot	80c
Tallow	6½ @ 7c
Machinery	40c
Engine	50c

Sundries.

Mineral Wool	per lb 1c
" extra	" 2c
Asphaltum Cuban	5c @ 8c
" Egyptian	5½ @ 9c
Benzine	₩ gal. 10½ @ 12c
Chalk	80c
" Block	80c
Dryer, Patent, Am'n	asst'd cans, 90; keg, 70

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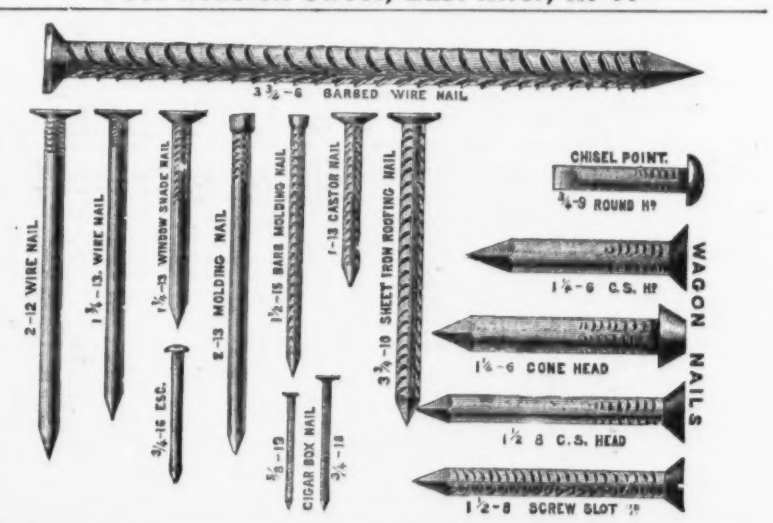
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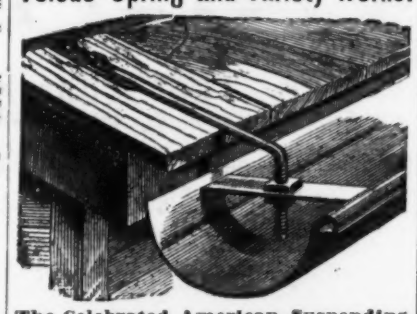
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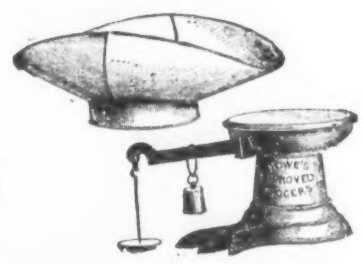


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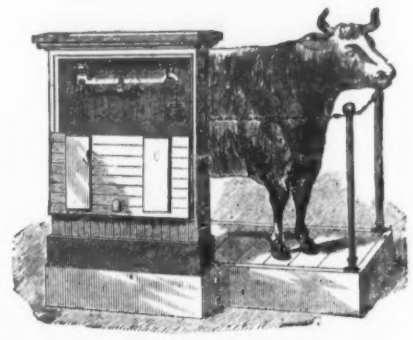




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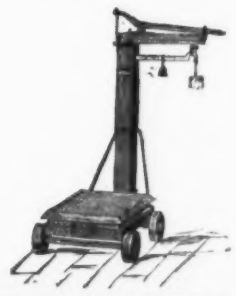


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To Manufacturers, Bleachers, Dyers, and all Users of Steam: We wish to call your special attention to our PATENT STEAM TRAP, acknowledged by practical engineers and manufacturers to be the best, simplest, most effective and durable Trap ever brought before the public. The simplicity of this Trap consists of doing away with all expansions and contractions, no glands or stuffing boxes, or bolts of any description required; no compound cylinders and no copper rods. The cover can be removed at any time to see it work; and if required the discharged water can be elevated from two to thirty feet, so that it can be used for other purposes. They will last from thirty to forty years. As regards frost and snow it makes no difference, as we have had and still have one working in the open air at Washington Mills, Lawrence, Mass., and it has done its work well, never having had any trouble with it, and bids defiance to all weather. That they have been thoroughly tested can be seen by the testimonials given below, of the few that have come to hand:

TESTIMONIALS.

Washington Mills, Lawrence, Mass., November 18, 1880.

Mr. R. Newton.—DEAR SIR: The Steam Trap we bought of you last August works admirably. Please send us another as soon as possible. Yours truly,
JAMES B. SINER, Mech. Supt.

Office of *Washington Mills,* Boston, December 24, 1880.

Providence Steam Trap Co.—GENTLEMEN: Please forward to Washington Mills as soon as possible six (6) ¾-inch Traps and send bill to me.
Yours, truly. HENRY F. COE, Treas.

Clyde Bleachery and Print Works, River Point, R. I., January 17, 1881.

Mr. R. Newton.—DEAR SIR: The Steam Trap we had of you is in successful and very satisfactory operation. Its simplicity in construction and undoubted durability will commend it to all who are in want of a superior Steam Trap. We shall order more when in need of any. Yours, truly, S. H. GREEN & SONS.

Kendall Manufacturing Co., Providence, R. I., Feb. 1, 1881.

Providence Steam Trap Co.—GENTS.: We have used one of your Steam Traps for some time and would say that we find it gives perfect satisfaction.
Yours, truly, NICHOLAS SHELDON, Treas.

A. & W. Sprague Mfg. Co., Cranston Print Works, R. I., Jan. 15, 1880.

Mr. Robert Newton.—DEAR SIR: The Steam Traps we bought of you work first-class and give every satisfaction, and appear to be very durable. We think them the best Steam Trap that we have ever had. When in want of more will write you.
I remain, yours, truly, THOMAS BRISTOW, Supt. Cranston Print Works

Providence, R. I., December 18, 1880.

Mr. Newton.—DEAR SIR: We have your Steam Trap working satisfactorily, and can conscientiously recommend it to all. Yours, very truly,
B. COLLINGHAM, Supt. Atlantic Mills.

ROBERT NEWTON, C. E. M. E., Inventor and Patentee, Providence, R. I.

PATENT OSCILLATING FIRE BARS.

We wish also to call your attention to R. Newton's PATENT OSCILLATING FIRE BARS, which for durability, economy and application are acknowledged by all practical engineers that have seen them up to the present time to be the best ever brought before the public. This invention the patentee has labored at more or less since 1851. These bars have long been wanted, and their use will at once prove their efficacy as an economiser of fuel and labor. These bars can consume from four to twenty-six pounds of coal per square foot of grate, per hour, and not warp; and the apertures can be kept clean so that they can get a regular supply of oxygen, which is the life-giving power of caloric. They can be applied to all kinds of boiler surfaces (except vertical), and can be fitted to the furnaces in about five hours. Testimonials can be forwarded, if required, to show that they are now in use in some of the largest firms in the world.

SOME OF THE ADVANTAGES: These bars allow the use of inferior coal; evaporating power is greatly increased. This is a great boon where boiler power and space is limited. This advantage cannot be over-estimated in the case of marine boilers. The oscillating of the fire bars both cuts and lifts the slug, and clears the apertures at the same time. The bars give four motions in one oscillation, and cannot get out of order. They are also free of expansion and contraction, both longitudinal and transversal, and however careless the stoker may be he cannot leave them so as to take any harm. They are so cast, and of such metal, that they are the most durable bar ever brought into use. All now in use are very much approved. They are very simple and cannot get out of order. Their cost is so reasonable that they come within the reach of all. The company are now granting licenses to several firms to make and apply them, and are open to arrange with other parties. N. B.—The company furnish first sets of models. ROBERT NEWTON, C. E. M. E., Inventor and Patentee.

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See Page 3.

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Importers of STEEL,

Removed to 30 Gold Street, New York.

Particular attention is paid to quality and temper for FILES, SAWS, EDGE TOOLS, TABLE and POCKET CUTLERY, TOOLS, TAPS and DIES; also for COLD ROLLED STEEL for CLOCK SPRINGS, CORSET CLASPS, &c.

A Large Assorted Stock of JOHN ROTHERY'S FILES always on hand.

Warranted Superior to any Steel in the Market, either English or American, for every purpose.

Also,

Combination Chrome Steel and Iron for Safes, Jails and Deposit Vaults.

Send for Circular and Price List.

CHROME CAST STEEL.

Chrome Steel Works,
Kent Avenue and Keap Street,
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JOLIET STEEL COMPANY,

MANUFACTURERS OF

Steel Rails,

ALL WEIGHTS.

The Company Warrant its Rails equal in quality to any manufactured in the United States.

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Office, Rooms D and E, Honore Building. **Works, Joliet, Ill.**

Steel.

R. MUSHET'S

Special Steel

FOR

LATHES, PLANERS, &c.

Turns out at least **double work** by increased speed and feed, **and cuts harder metals** than any other Steel. Neither hardening nor tempering required.

Sole Makers,

SAMUEL OSBORN & CO.,

Sheffield, England.

Represented in the United States by

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Nos. 11 & 13 Oliver Street, **BOSTON.**

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W. R. HART, Agent,

208 S. Fourth St., Philadelphia, Pa.

IMPORTERS OF

STEEL AND IRON RAILS,

Tin and Terne Plates,

Swedish and Norway Iron.

BESSEMER STEEL WIRE RODS,

Pig Iron, Spiegeleisen, Ferromanganese, Scrap Steel and Old Iron Rails.

MANUFACTURERS OF

STEEL COMPRESSED SHAFTING,

"Benzon" Homogeneous Plates

For Boilers, Fire-boxes, &c.

Axles, Crank Pins, Spring Steel,

And all other kinds of

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For Railroad purposes.

REYNOLDS, CARTER & REYNOLDS,

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Cable Address:

REYNOLDS,

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Iron and Steel Merchants

AND

ENGINEERS.

Exporters of

Iron and Steel Rails, Blooms, Spiegeleisen, Pig Iron, Old Rails, Scrap Iron, Iron Ore, and all kinds of Railway Plants, Engines and Piping for Water-works, Mining Machinery, &c.

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MACHINISTS' TOOLS

FROM THE LATE

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Of Lathes and Planers.

Mr. Wright having formerly been a contractor in building the same, will give superior work to all who favor him with their orders.

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Lehigh Coals.

The following superior and well-known Lehigh Coals are mined by ourselves and firms connected with us, viz.

A. Pardee & Co. { HAZLETON. CRANBURY. SUGAR LOAF.
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Copper,
Half Copper,
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TEA KETTLES.
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MANUFACTURERS OF

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Bridge Iron, Iron Beams, Channel Bars, Car Truck Channels, Angles, Tees, Universal Mill Plates, Bar Iron, Light Steel and Iron Rails.

Special attention given Unusual Shapes and Sizes.

Lithographs of sections and book of detailed information giving calculation of strain, &c., furnished to Engineers and Architects on application.

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ESTABLISHED 1857. CAPITAL, $3,000,000. INCORPORATED 1869.

Works at Chicago, Ill., and Milwaukee, Wis.

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MERCHANT BAR, FISH PLATES, PIG METAL,

IRON RAILS & BESSEMER STEEL RAILS.

Present Annual Capacity of these Works.

Fish Plates	13,000 tons
Merchant Bar	40,000 "
Pig Metal	140,000 "
Iron Rails	110,000 "
Steel Rails	100,000 "
Total Capacity per year	403,000 "

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37 Mitchell Block, Milwaukee, Wis.

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A general assortment of mine and narrow gauge rails kept on hand, from which shipments can be made promptly.

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THE SIEMENS-ANDERSON STEEL CO.,

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STEEL BLOOMS, SPIEGELEISEN,

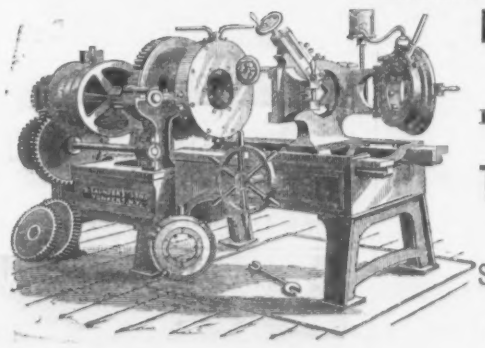
FERROMANGANESE UP TO 75 PER CENT.

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D. SAUNDERS' SONS,

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Pipe Cutting & Threading Machines,

For Pipe Mill and Steam Fitters' Use.

TAPPING MACHINES

For Steam Fitting.

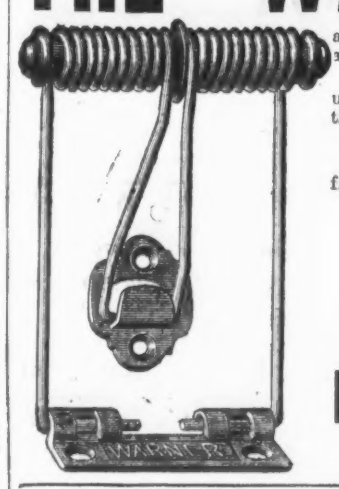
ALSO,

Steam & Gas Fitters' Hand Tools.

YONKERS, N. Y.

Send for Circulars.

THE "WARNER" DOOR SPRINGS



are the most simple, most effective and most convenient ever introduced, and the immense sale we are having shows their great popularity and superiority.

There never was a Spring made that is so durable, so complete in its action, operating with a uniform pressure, holding the door **tight** when **closed,** and allowing it to open without increasing the pressure at any point.

When the door is opened about 130 degrees of a circle, it will press and hold it open.

The Spring is easily **unhooked** and **rehooked**—in an instant—from the **door** and also from the **jamb,** without removing a **screw** or **pin.**

This is a Convenience Possessed by no other Spring in the Market.

We are making this season three sizes, viz:
No. 1 For Screen or Light Storm Doors.
No. 2 For Medium Doors.
No. 3 For Heavy Doors.
They are for sale by most of the prominent jobbers of the United States and Canada.
Correspondence solicited.

FREDERIC BARTLETT,

FREEPORT, ILLINOIS.

ESTABLISHED IN 1859.

THE IRONMONGER AND METAL TRADES ADVERTISER

PUBLISHED EVERY SATURDAY.

THE OLDEST AND CHIEF REPRESENTATIVE OF THE IRON, HARDWARE AND METAL TRADES.

OFFICE: 44a CANNON STREET, LONDON, E. C.

ADVERTISEMENTS AND SUBSCRIPTIONS ARE RECEIVED AT THE VARIOUS OFFICES OF "THE IRON AGE," NAMELY:

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SPECIAL FEATURES.

Notes of Novelties.—This is a department of the journal always watched with interest by the trade, as it contains an account, from week to week, of the novelties which manufacturers and inventors are introducing to the notice of the trade. These articles are freely illustrated.

Special Correspondents.—The *Ironmonger* has a deserved reputation for its special correspondence from all the principal Continental, British and manufacturing centers. The writers are gentlemen holding important positions in the districts with which they are connected, and possess facilities for acquiring information specially suited for the columns of the *Ironmonger*. ***The Week, Legal News, Trade Notes, Bankruptcies, Foreign Notes, Colonial Jottings, Merchants' Circulars, &c.,*** are each departments of the journal, containing a digest of all matters of direct interest to the Iron, Hardware and Metal Trades In addition to the above, there is a carefully classified list of Patents, together with Editorial Notes, French Belgian and other Special Correspondence.

SUBSCRIPTIONS

to the *Ironmonger and Metal Trades' Advertiser*, with which is sent every fourth week the Foreign Supplement (see below), may commence from any date, but are not received for less than a year complete. The rate is $5 per annum, inclusive of postage to any part of the world outside Great Britain. To every subscriber is presented, free, in the course of his year, a handsome and useful ***Ironmongers' Diary and Text Book,*** a work sold to non-subscribers at 75 cents.

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In the spring and autumn of each year there is published a Special Issue, the circulation of which is not less than **Twelve Thousand** (12,000) copies

THE IRONMONGERS' DIARY AND TEXT BOOK.

This is an annual, **presented free to every Subscriber to the IRONMONGER AND METAL TRADES' ADVERTISER.** It contains a large number of ruled skeleton pages for diary and other entries, and in addition much useful reference information, varied from year to year. It is handsomely bound in cloth, gilt; and as copies are used in thousands of establishments for a whole year, it is obviously a medium of exceptional value for advertisements. Sold to non-subscribers at 75 cents.

THE FOREIGN SUPPLEMENT,

With which is incorporated The Universal Engineer,

is published every fourth week in connection with the extensive and world-wide circulation of the *Ironmonger* itself. The dates of its publication for the next twelve months will be as follows:

NOVEMBER 6, DECEMBER 3 and 31, 1881, JANUARY 28, FEBRUARY 25, MARCH 25, APRIL 22, MAY 20, JUNE 17, JULY 8, AUGUST 5, and SEPTEMBER 2 and 30, 1882.

This Supplement is published in

FOUR LEADING COMMERCIAL LANGUAGES

of the world, including English, and is sent to all the countries where they are spoken, thus placing the contents of the *Ironmonger* not only within reach but in the native language of eighty millions of *German*, forty-two millions of *French*, twenty-eight millions of *Italian*, and fifty-one millions of *Spanish* speaking people; or, in all, over two hundred millions of inhabitants in the principal nations where the best purchasers of manufactured goods are to be found.

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Advertisers will do well to use Illustrations freely. Where economy of space is an object, a left page illustrated can be described in one language and be suitably described in four or more languages on the opposite or right page without illustrating.

THE WHOLE FOREIGN HARDWARE TRADE

so far as our experience of twenty years is concerned, will be covered by THE FOREIGN SUPPLEMENT at least twice a year. Thus a Price List or Advertisement inserted in the *Ironmonger* and FOREIGN SUPPLEMENT is a strikingly powerful and most efficient way of publicity not to be compared with any of the other ordinary channels of communication.

B. KREISCHER & SONS,

FIRE BRICK.

BEST AND CHEAPEST.

Established 1845.

Office, foot of Houston Street, East River, NEW YORK.

NEWTON & CO.,

ALBANY, N. Y., Manufacturers of

FIRE BRICK

Stove Linings,

Range and Heater Linings

Cylinder Brick, &c., &c.

For Glass and Steel Works.

SILICA,

Bricks and Cement,

English Fire Bricks.

RIMINGTON BROS. & CO.,

Newcastle-on-Tyne.

Agent on this side

S. A. RIMINGTON,

40 & 42 Broadway,

NEW YORK.

M. D. Valentine & Bro

Manufacturers of

FIRE BRICK

And Furnace Blocks

DRAIN PIPE & LAND TILE.

Woodbridge, - - - N. J.

BORGNER & O'BRIEN,

Manufacturers

FIRE BRICK

AND

Edge Pressed Furnace Blocks,

CLAY RETORTS, TILES, &c.,

Twenty-third Street,

Above Race, *PHILADELPHIA.*

Twenty years' practical Experience.

WATSON FIRE BRICK CO.,

ESTABLISHED 1836.

Successors to JOHN R. WATSON, Perth Amboy, New Jersey

Manufacturers of

FIRE BRICK,

FOR ROLLING MILLS, BLAST FURNACES, FOUNDRIES GAS WORKS, LIME KILNS, TANNERIES, BOILER and GRATE SETTING, GLASS WORKS, &c.

Fire Clays, Fire Sand, and Kaolin for Sale.

HENRY MAURER,

Proprietor of the

Excelsior Fire Brick & Clay Retort Works,

Manufacturer of **FIRE BRICK, HOLLOW BRICK AND CLAY RETORTS.**

WORKS: PERTH AMBOY, NEW JERSEY.

Office & Depot, **418 to 422 East 23d St., N. Y.**

TROY FIRE BRICK WORKS,

Troy, N. Y.,

JAMES OSTRANDER & SON,

ESTABLISHED 1848,

Manufacturers of

FIRE BRICK,

Tuyeres Tiles, Blast Furnace Blocks, &c. Miners and Dealers in Woodbridge Fire Clay and Sand, and Staten Island Kaolin.

Established 1864.

GARDNER BROTHERS,

Manufacturers of

STANDARD SAVAGE FIRE BRICK, TILE & FURNACE BLOCKS,

OF ALL SHAPES AND SIZES.

Clay Gas Retorts and Retort Settings, and Miners and Shippers of Fire Clay.

OFFICE: 116 Smithfield St., Pittsburgh, Pa.
WORKS: Mt. Savage Junction, Md., and Lockport, Pa.

HALL & SONS,

FIRE BRICK,

Buffalo, N. Y.

CHAS. D. COLSON,

FIRE BRICK,

Foundry Facings, Sand, Tools and Supplies.

CHICAGO, ILL.

UNION MINING COMPANY.

Mount Savage Fire Brick.

EDWARD J. ETTING, Agent,

No. 230 South Third St., Philadelphia, Pa.

THOMAS MORTON,

Manufacturer of

CABLE, COPPER, IRON AND STEEL SASH CHAINS, for suspending window sashes. Also, Copper Champion Chains, with patent attachments, for same purpose. Agents wanted in the principal cities in the United States. Apply at

65 Elizabeth Street, New York.

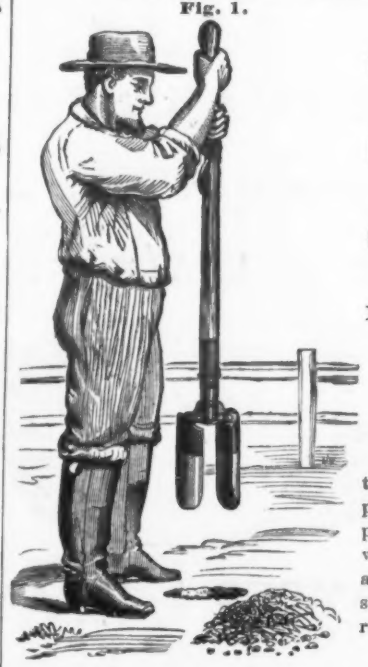
HENRY DISSTON & SONS,

KEYSTONE SAW, TOOL, STEEL & FILE WORKS,

Front and Laurel Streets, PHILADELPHIA.

DISSTON'S SAMSON TREE PLANTER AND POST HOLE DIGGER.

Fig. 1.



Patented May 20, 1870.

Price, - - - $37.50 per dozen.

No Farmer, Nurseryman, Railroad or Telegraph Company

SHOULD BE WITHOUT ONE.

NO BACK-ACHE.

NO KNEE-WORK.

NO CLOGGING.

Fig. 2.



This tool has been thoroughly tested, and has given the greatest satisfaction to all who have tried it. The principle on which it works makes it self-cleaning and prevents adhesion in sticky soil; therefore it always works free and easy. It is far superior to all plungers, augers and boring machines, as it works well in stony, sandy, or clay soils; quicksand under water is as easily removed as though no water existed.

DIRECTIONS.

Plunge the Digger into the ground, as shown in cut, Fig. 1, and when the soil is loosened pull out the lever with one hand, as shown in cut, Fig. 2, which will press the dirt between the blades; then draw the Digger from the hole, keeping hold of the lever with one hand and the handle with the other. When the Digger is clear of the hole, you can deposit the load anywhere within reach by simply pressing down the lever, which will open the blades and the dirt will fall from between them. The Digger is then ready for another plunge. The steel blades are nine inches long, and the whole tool five feet long. *For sale at Hardware and Agricultural Stores.*

HENRY DISSTON & SONS.

STANDARD SHAFT COUPLING SPRING.

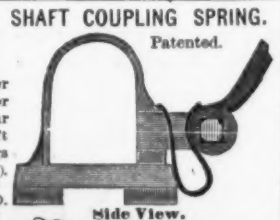
CHICAGO, July 24, '81.

Gentlemen:

You may enter our order for 5000 sets of your Standard Shaft Coupling Springs (600 sets a month).

A. A. ABBOTT & CO.

Patented.



Side View.

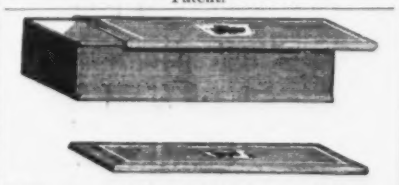


Front View.

One dozen pairs, japanned expressed to the responsible Hardware or Carriage trades for $1.50 (per gross, $15, 4 mos. note, 5 per cent. off 30 days, 10 off spot cash). Discount to jobbers. Splendid selling article for commercial travelers. (Nickel plated springs $3 per doz. pairs. Dealers and the trade also supplied by the E. D. Clapp Mfg. Co., Auburn, N. Y., and Wilcox & Howe, Birmingham, Conn.; Crandall, Stone & Co., Mfrs. Carriage Trimmings, Binghamton, N. Y. Perfect Anti-Rattler and Shaft Bolt Locker, and looks neat on a buggy. Sold by all hardware dealers everywhere. Orders, large or small, filled promptly.

A. G. MOREY & CO., 90 Randolph Street, (McCormick Block), CHICAGO,

Manufacturers for U. S. & Canada, under Letters Patent.



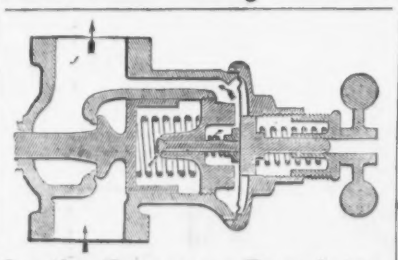
WM. L. DAVIS, Chelsea, Mass.,

Manufacturer of

WINDOW WEIGHTS,

Sole Manufacturer of

Park's Patent Folding Lunch Box.



Curtis Pressure Regulator.

Is made entirely of metal; occupies the same space as a globe valve. It has no glands or packing, and is a lock-up valve. Write for circular. Manufactured by

CURTIS REGULATOR CO.,

59 Beverly Street, BOSTON, MASS.

HOWARD IRON WORKS,

BUFFALO, N. Y.,

Manufacturers of

BOLT CUTTERS

AND NUT TAPPING MACHINES,

(Schlenker's Patent,)

Send for Illustrated Catalogue.

STEEL BRASS RUBBER **STAMPS** **STENCIL** BRANDS PAINT

STAMPING INK &c

A. M. MICHAEL, ALBANY, N.Y.

Brass Molders and Manufacturers

write for sample and price of Fine Red Brass Molding Sand.

W. J. CHAPMAN, Baltimore, Md.



Gentlemen.—This cut illustrates our

CAST IRON

Furnace Lamps

which are superceding entirely the Tin Lamps wherever introduced, in consequence of their durability. They are now extensively used in the Iron Districts of Ohio and some in Pennsylvania.

We call your attention to and solicit your order for them, confidently asserting that they are an **A No. 1 article in every respect.**

Sample sent if desired.

PRICE, $12 PER DOZEN.

Taylor & Boggis,

CLEVELAND, O.

PERFORATED SHEET METALS.



For Coal and Ore Separators, Revolving Screens Jigs, Washers, Stamp Batteries, Mining and Smelting Works, Silver Reduction and Concentrating Works, &c., &c.

For Centrifugals, Brewing, Distilling, Wool and Sugar Machinery, Purifier Trays for Gas Works, Coal and Coke Works, Flour, Cotton, Oil, Paper and Pulp Mills, &c.

Iron, Steel, Copper, Brass, Zinc and other metals punched to any size and thickness, for all uses.

HARRINGTON & OGLESBY CO.

Nos. 43, 45 & 47, South Jefferson St., CHICAGO, ILL.

Special discounts to the trade. Correspondence solicited.

American Tool Co.,



Manufacturers of

TOOL CHESTS OF ALL SIZES.

Adapted for the use of **Boys, Youths, Gentlemen, Farmers, Planters, Carpenters, Railroads and Mines**; fitted up complete with a superior quality of **Tools**, and suited to the wants of the **Hardware, Toy, Notion and Variety** trades. **Export trade** solicited, **and a full stock of large-sized Chests always on hand.** Quality considered, we think our goods will be admitted by buyers the cheapest that have yet been offered by any manufacturer in the United States or Europe. **Illustrated descriptive catalogue** furnished free on application with prices.

MECHANICS' TOOLS AND HARDWARE SPECIALTIES, &c.

Warehouse and Salesroom, 116 Chambers St., New York, U. S. A.

Factories, 200, 214, 218 W. Houston St near Varick.

GREEN'S PURE SILICA FIRE BRICK,

MADE BY

LACLEDE FIRE BRICK MANUFACTURING CO.,

SPECIALLY ADAPTED FOR

Pernot and Siemens Open Hearth Steel Furnaces and for Glass Furnaces.

Office, 901 Pine St., St. Louis, Mo.

John T. Lewis & Bros.

No. 231 South Front St., PHILADELPHIA.

JOHN T. LEWIS & BROS. WARRANTED PURE WHITE LEAD. PHILADA.

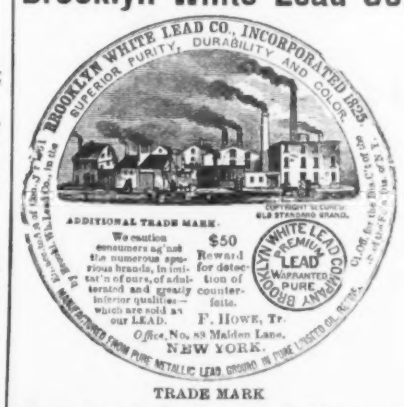
TRADE MARK.

MANUFACTURERS OF

Pure White Lead, Red Lead, Litharge, Orange Mineral, Linseed Oil,

AND PAINTERS' COLORS.

Brooklyn White Lead Co.



TRADE MARK

White Lead, Red Lead & Litharge.

No. 182 Front Street, NEW YORK,

JOHN JEWETT & SONS,

Manufacturers of the well-known brand of

WHITE LEAD.

JEWETT & SONS, PERFECTLY PURE WHITE LEAD.

TRADE MARK

ALSO MANUFACTURERS OF

LINSEED OIL.

182 Front Street, NEW YORK.

ATLANTIC WHITE LEAD PURE WARRANTED ROBERT COLGATE & Co. TRADE MARK

The Atlantic White Lead and Linseed Oil Co.,

Manufacturers of

White Lead (Atlantic), Red Lead, Litharge, Glass Makers' Litharge and Orange Mineral;

LINSEED OIL,

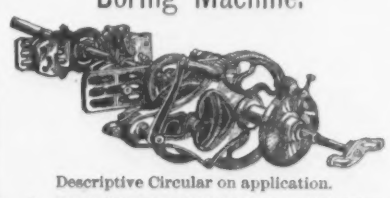
Raw, Refined and Boiled.

ROBERT COLGATE & CO.,

287 Pearl St., NEW YORK.

FLANDERS' PATENT

Portable Locomotive Cylinder Boring Machine.



Descriptive Circular on application.

L. B. FLANDERS MACHINE WORKS,

1025 Hamilton St., Philadelphia, Pa.

Mellert Foundry & Machine Co.,

Limited,

(Works Established at Reading, Pa., in 1848.)

Manufacturers of



Specials, Flange Pipe, Retorts, Valves and Hydrants, Lamp Posts, &c. **The Improved Canadian Turbine Water Wheel.** Machinery and Castings for Furnaces, Rolling Mills, Grist and Saw Mills, Mining Pumps, Hoists, &c. Columns, Brackets, Iron Railings, &c.

Offices:

Second and Chestnut Sts., Reading, Pa., and 74 Pine Street, New York City.

THE BEST NUT TAPPING MACHINE LATEST IMPROVEMENTS PURDY MACHINE CO. 23 CENTER ST. CLEVELAND O.

PHILADELPHIA.

Corrected Weekly by Lloyd, Supplee & Walton.)

erms, 30 days. For 60 or 90 days, interest added at 10 per cent. per annum.

Anvils.
Peter Wrights, ℔ lb ..10½c
Over 250 lbs ..11c
Eagle (American) .100 ℔ lb—dis 30 %

Apple Parers.
Penn Apple Parer ..$6.50
Rotary Peach Parers ..13.50
Lots of 10 to 25 dozen special prices.

Axes.
Hunt's Kentucky and Yankee..per doz $9.50 @ 10.00
Mann's Red Warrior .. " 9.00 @ 9.40
Richland Chief .. " 8.50 @ 9.00
Beveled Axes .. add 50c " net
Double Bit Axes .. net " 19.00

Augers and Auger Bits.—New List January 1.
Bates' Nut Augers ..dis 40 %
Cook's Augers ..dis 40&10 %
Watrous' Ship Augers ..dis 15 %
Benjamin Pierce Auger Bits ..dis 35 %
Griswold Auger Bits ..dis 40 %
Cook's " ..dis 40&10 %
Jennings' " ..dis 10, 10&10 %
Bonney's Pat. Hol. Augers, list $48 ℔ doz..dis 25&10 %
Stearns' Pat. Hol. Augers, list $48 ℔ doz..dis 20&10

Balances.
Light and Common ..dis 15&10 %

Bells.
Bevin Bros. Mfg. Co. Light Hand Bells..dis 65&10 %
Swiss Pattern Hand Bells..low list dis 40&10 %
Connell's Door Bells ..dis 20 %
St. Western & Kentucky Cow, new list..dis 50 %

Bolt and Rivet Clippers.
Chambers' No. 1. for ⅝ bolt..each, $7.50
" No. 2, " ¾ " .. " 9.00 } dis 15 %
" No. 3, " ⅞ " .. " 12.00

Boring Machines.
Upright, without Augers..List 5.50
Angular, without Augers.. " 6.75 } dis 40 %

Bolts.—Eastern Carriage Bolts..dis 80 %
Philadelphia .. new list dis 70&10 %
Stanley, Wrought Shutter ..dis 50&10 %

Braces.—Barber's ..dis 40&5 %
Backus ..dis 50 %
Spofford ..dis 50&5 %
American Ball ..dis 55 %

Butts.—Cast Fast Joint, Narrow ..dis 40&10 %
" " Broad ..dis 40&10 %
Cast Loose Joint, Narrow ..dis 50&10 %
" " Broad ..dis 50&10 %
" Acorn, Loose Pin ..dis 50&10 %
" " " Jap'd ..dis 55&10 %
" Mayer's Loose Joint ..dis 50&10 %
Wrought Loose Pin ..dis 50&10 %
" Table Hinges and Back Flaps..dis 45&10 %
" Narrow, Fast ..dis 45&10 %
" Loose Joint ..dis 50&10 %

Blind Butts.
Parker ..dis 70 %
Clark ..dis 70 %
Shepard ..dis 70 %
Lull & Porter ..dis 60⅔&10 %
Huffer's ..dis 50 %

Chains.—German Halter and Coil, new list Oct. 22, 1879 ..dis 50&10 %
Galvanized Pump ..℔ lb 9½c net
Best Proof Coil Chain—English.

℔ lb	12	10	8¼	7⅛	7¼	7	gold
	5-16	¼	5-16	⅜	7-16	⅞	in.

Chisels.—Socket Framing ..dis 65&10 %
Socket Firmer ..dis 65&10 %
Butcher's ..$4.00 to $ gold

Castors.—Bed (new list July 1, 1880,) ..dis 40&5 %
Plate ..dis 40&5 %

Coffee Mills.—Box and Side, new list Jan. 1, 1880 ..dis 45 %
Enterprise ..dis 30 %

Cutlery.—Walden Pocket ..new list net
Landers, Frary & Clark, J. Russell & Co., Lamson & Goodnow Mfg. Co. and Meriden Cutlery Co., Manufacturers' prices net.

Drawing Knives.
Hart Mfg. Co.'s ..dis 65&10 %
Adjustable Handle ..dis 15 %

Fry Pans.
Tinned ..dis 45 %

℔ doz.	$3.50	4.00	4.50	5.00	5.50	6.50	7.50	9.00	10.00
No.	0	1	2	3	4	5	6	7	8

Burnished ..dis 60&10 %

℔ doz.	$3.00	3.75	4.25	4.75	5.25	6.00	7.00	8.00	9.00
Fo.	0	1	2	3	4	5	6	7	8

Files.
Nicholson ..dis 40 %
Disston ..dis 40 %
Butcher ..$4.50 ℔
Spencer ..$4.50 @ 4.75 ℔
E. M. Boynton, new list ..25 %

Fluting Machines.
Eagle—3¼ in. roll ..each, $2.15 } dis 25 %
" —5¼ in. roll .. " 2.85 }
Crown—4½ in. roll .. " 3.40 }
" —6 in. roll .. " 4.00 } dis 25 %
" —8 in. roll .. " 6.50 }
Geneva Fluter ..dis 25 %
Favorite com. Fluter & Sad Iron ..℔ doz $10.50 net

Hammers.
Yerkes & Plumb's, new list ..dis 30 %

Handles.
Boynton's Pat. Saw Handles ..35c per pair net.

Hatchets.
Yerkes & Plumb, new list ..dis 30 %
Hunt ..dis 20&10 %

Hinges.
Strap and T ..dis 45&10&10 %

Horse Nails.

	Nos.	4	5	6	7	8	9	10
Ausable		30	27	25	24	23	22	
" Pol'ed & P't'd and Blued and Pointed.		31	28	2	25	24	23	
Globe	New list.	28	26	23	22	21	20	
Clinton		32	30	19	18	17		
" Polished & Pointed		23	21	20	19	18		

Porter, all sizes ..℔ lb 15c. net
Discount on Ausable and Clinton, 30 %; Globe, 12½

Locks and Knobs.
Branford ..dis 45&2 %
Gaylord Cabinet ..dis 25&2 % cash
American Padlocks ..dis 40 &2 % cash
Scandinavian Padlocks ..dis 50 %

℔ doz.	$5.00	5.50	6.50	7.50	8.50	10.00	12.50	} dis 60 %
No.	57	58	59	60	61	62	63	
℔ doz.			$18.00		26.00		33.00	} dis 60 %
No.			64		65		66	

Lanterns.
Square Candle and Oil ..℔ doz
Tubular ..No. 0, $8.65; No. 1, $10.15 ℔ doz net
Globes, 35 cents extra per doz. net.

Lawn Mowers.—Pennsylvania ..new list
Philadelphia ..
Excelsior ..dis 30 %

Lawn and Garden Pumps.
Holland Patent ..List $5.00 dis 10 %

Mattocks.
Long and Short Cutter ..new list..35 %
Pennsylvania Pattern ..per doz 35 %

Molasses Gates.
Enterprise Mfg Co.'s Measuring Faucets..dis 30 %
Stebbins' Gates ..dis 80%
Lincoln's " ..dis 50&10 %
Landers, Frary & Clark's Petroleum ..dis 20&10 %
Brass Liquor Cocks, new list Jan. 1 1880 ..dis 40 %
Cork Lined " ..dis 20 %

Meat Cutters.—Penna'vania Meat Cutter..dis 40&10 %
Dixon's ..dis 30 %
Woodruff ..dis 30 %
Stowe ..dis 30 %
Hale's ..new list, dis 40, 10&2 cash
American ..dis 25 %
Stuffers ..dis 30 %
Enterprise Stuffers ..dis 30 %

Planes.—Ohio Tool Co ..dis 30&5 %
Scioto ..dis 40 %
Auburn ..dis 40&5 %
New York Tool Co ..dis 40 %
Bailey ..dis 20&10 %

Plane Irons.—Ohio Tool Co ..dis 20 %
Butcher's ..&, $4.50

Plumbs and Levels.
Stanley's Adjustable ..dis 65&10 %
" Non-Adjustable ..dis 65&10 %

Picks.—New list ..35 %
Pumps.—Bickford ..$5.00, dis 10 %
Rules.—Stanley Boxwood ..dis 70&10 %
Stanley Ivory ..dis 60&10 %
Steelyards.—Hart's Pattern ..dis 30&10 %

℔ dos.	$14.50	17.75	21 00	26.50	31 00	35.50
Lbs	50	100	150	200	250	300

American Pattern ..dis 30&10 %

℔ doz.	$8.00	10.25	13.75	14.50	16.75	19.50
Lbs.	50	100	150	200	250	300

Squares.
Steel and Iron ..dis 50 %; full case, dis 50&10 %
Try Squares, Stanley ..dis 50&10 %
Disston's Try Squares ..dis 40 %
Scythes.—Golden Clipper, Damascus Blade, Boxed and Sharpened ..℔ doz $9.00 net
Clipper No. 10, Bronzed Blade, Boxed and Sharpened ..℔ doz $8.50 net
Clipper No. 5, Painted Red, Boxed and Sharpened ..℔ doz $8.00 net
Saws.—Disston's Hand, Panel and Rip ..dis 20 %
Disston's Circular ..dis 40 %
Cross-Cut No. 2, Plain Tooth ..dis 40%
" Patent Tooth ..dis 40%
" Champion Tooth ..dis 40%
Boynton's Lightning Cross Cut, new list ..dis 20 %
" One Man, all lengths, " ..dis 20 %
" Billet Webs, 30 inch, " ..dis 25 %
" Lightning Buck Saws, cross bar..dis 25 %
" Hand, Panel and Rip..dis 25 %

Shovels and Spades.
Oliver Ames & Sons, new list ..dis 15 %
Griffiths ..dis 40&10 %
Rowland ..dis 40&10 %
Sad Irons.—4 to 10 lbs ..℔ lb 3½c
Mrs. Potts' Patent ..dis 10 %
Stone.—Arkansas Oil Stone ..℔ lb $2.00 net
Washita Extra ..℔ lb 28c net
" No. 1 .. " 22½c
" No. 2 .. " 18c
" Slips .. " 45c
" Axe .. " 130 net
Turkey Oil Stone No. 1 ..℔ lb $1.00 net
Hindostan Oil Stone No. 1 ..℔ lb 60 }
" Axe Stone .. " 8c } dis 20 & 10 %
" Slips .. " 10c }

Screws.
Flat Head Iron ..dis 35 %
" Brass ..dis 35 %
Round Head Brass ..dis 25 %
" Iron ..dis 30 %

Spoons.
Plated ..dis 40, 5&2 %
German Silver ..dis 30, 10&2 %
Britannia, Boardman's ..dis 65&2 %
" Parker's ..dis 65&2 %
Tinned ..dis 10 %

Springs.—Torrey ..℔ doz $2.10 10 %
Philadelphia ..5 in., $4.00; 8 in., $7.75 ℔ doz. dis 25 %
Chatfield No. 1, $2.75; 2, $3.25; 3, $4.00 ℔ doz, dis 33⅓ %
Gem Coil No. 1, Large Jap'd ..℔ doz $4.00 }
" No. 2, Medium Jap'd .. " 2.75 } 25&10 %
" No. 3, Small Jap'd .. " 2.00 }

Stocks and Dies. ..dis 10&5 %
Stove Polish.—Gem ..℔ gross, $4.50, dis 5 %
Dixon .. " 6.00, dis 10%
Onyx .. " $4.00 66 4.25 net
Tacks, ..dis 30&10 %
Shoe Nails—4-8, 5½c.; 3½-8, 10c ℔ lb ..10 %
Double Pointed Tacks ..dis 40&5 %

Traps.
Genuine Oneida—Newhouse ..dis 35 %
Im. Oneida—Newhouse list, first qual ..dis 55 %
Vises.—Solid Box, Trenton new list ..dis 35 %
Wrenches.—Agricultural ..dis 70&5 %
Coes' Genuine ..dis 50&3 %
" " Mechanics' ..dis 50&10 %
" " Mail. Bar ..dis 75 %
Philada. Tool Co., Duplex ..dis 20&5 %

Wire.
Bright or Ann'd, No. 0 to 18 ..dis 50 to 52½ %
" No. 19 to 26 ..dis 57½ to 60 %
" No. 27 to 36 ..dis 62½ to 65 %
Coppered, 0 to 18 ..dis 47½ to 50 %
Tinned Broom Wire ..dis 52½ to 55 %
Galvanized No. 7 to 18 ..Market List, dis 42½ to 45 %

Wringers.
Peerless No. 2½ ..
" " 2 ..
Universal, No. 2½ ..
" " 2 ..
Novelty, No. 10 ..
" " 2 ..

PITTSBURGH.

Merchant Iron.

TERMS.—Note or acceptance at 60 days, with current rate of exchange on New York, or a discount of 2 per cent. for cash, if remitted within 10 days from date of invoice.

For fluctuations and discounts on card rates see weekly Pittsburgh Trade Report.

The following are card rates.

Flat Bar.

1½ to 4 by ⅜ to 1 inch ..2.5c
4½ to 6 by ⅜ to 1 " ..2.6c
1⅝ to 6 by 1⅛ to 1¾ " ..2.9c
1¾ and 1⅞ by ⅜ to ¾ " ..2.6c
1 and 1¼ by ⅜ to ¾ " ..2.7c
⅝, ¾ and ⅞ by ⅜ to ⅝ inch ..2.9c

Rounds and Squares.

1 to 1⅞ ..2.5c | ⅝ to 9-16 ..2.7c
2 to 2⅝ ..2.7c | ⅝ to 7-16 ..2.9c
2¾ to 3¼ ..3.0c | ⅜ ..3.1c
3½ to 4 ..3.5c | 5-16 ..3.3c
4¼ to 6 ..4.0c | ¼ ..3.5c
¾ to ⅞ ..2.6c | 3-16 ..5.5c

Oval Iron.

⅞ to 1⅛ ..2.9c | ⅛ ..3.3c
⅝ to ¾ ..3.1c | ⅜ ..3.7c

Half Oval and Half Round.

⅞ to 1¼ inch ..2.2c | ⅛ inch ..4.0c
⅝ to ¾ " ..3.7c | ⅜ " ..5.5c

Horse Shoe.

⅝ to 1¼ by 5-16 to ⅞ inch ..3.5c

Wagon Box Iron.

⅞ Inch, Nos. 13 and 14 ..3.7c
⅞ " " 11 and 12 ..3.5c
⅞ " " 13 and 14 ..3.9c
⅞ " " 11 and 12 ..3.8c
⅞ " " 13 and 14 ..4.4c
⅞ " " 11 and 12 ..4.1c

Hearry Bands.

3½ to 6 by ¼ and 5-16 inch ..2.7c
1⅝ to 3½ by ¼ and 5-15 " ..2.7c
1 to 1⅝ by ¼ and 5-16 " ..2.8c
⅝ to ⅞ by ¼ and 5-16 " ..3.0c
⅝ and ⅛ by ¼ and 5-16 " ..3.5c

Light Bands.

1⅝ to 6 by ⅛ to 3-16 ..3.0c
1⅝ to 6 by Nos. 11 and 12 ..3.1c
1 to 1⅝ by ⅛ to 3-16 ..3.1c
1 to 1⅝ by Nos. 11 and 12 ..3.2c
⅞ and 13-16 by ⅛ to 3-16 ..3.4c
⅝ and 13-16 by Nos. 11 and 12 ..3.5c
⅝ and 11-16 by ⅛ to 3-16 ..3.7c
⅝ and 11-16 by Nos. 11 and 12 ..3.8c
⅝ and 9-16 by ⅛ to 3 16 ..4.0c
⅝ and 9-16 by Nos. 11and 12 ..4.1c
⅛ inch by ⅛ and 3-16 ..4.3c
⅛ inch by Nos. 11 and 12 ..4.4c

Hoop Iron.

1¼ to 4, Nos. 13, 14 and 15 ..3.3c
1¼ to 2, Nos. 16, 17 and 18 ..3.4c
1¼ to 2, No. 19 ..3.5c
1¼ to 2, No. 20 ..3.6c
1¼ to 2, No. 21 ..3.6c
1¼ to 2, No. 22 ..3.7c
15-16, 1, and 1¼, Nos. 13, 14 and 15 ..3.5c
15-16, 1, and 1¼, Nos. 16, 17 and 18 ..3.6c
15-16, 1, and 1¼, Nos. 19 and 20 ..3.7c
15-16, 1, and 1¼, No. 21 ..3.8c
15-16, 1, and 1¼, No. 22 ..3.9c
⅞, Nos. 13, 14 and 15 ..3.7c
⅞, Nos. 16, 17 and 18 ..3.8c
⅞, Nos. 19 and 20 ..3.9c
⅞, No. 21 ..4.0c
⅞, No. 22 ..4.1c
13-16, Nos. 13, 14 and 15 ..3.9c
13-16, Nos. 16, 17 and 18 ..4.0c
13-16, Nos. 19 and 20 ..4.1c
13-16, No. 21 ..4.2c
13-16, No. 22 ..4.3c
¾, Nos. 13, 14 and 15 ..4.0c
¾, Nos. 16, 17 and 18 ..4.1c
¾, Nos. 19 and 20 ..4.2c
¾, No. 21 ..4.3c
¾, No. 22 ..4.4c
11-16, Nos. 13, 14 and 15 ..4.2c
11-16, Nos. 16, 17 and 18 ..4.3c
11-16, Nos. 19 and 20 ..4.4c
11-16, No. 21 ..4.5c
11-16, No. 22 ..4.6c
⅝, Nos. 13, 14 and 15 ..4.4c
⅝, Nos. 16, 17 and 18 ..4.5c
⅝, Nos. 19 and 20 ..4.6c
⅝, No. 21 ..4.7c
⅝, No. 22 ..4.8c
9-16, No. 23 ..4.9c
9-16, Nos. 13, 14 and 15 ..4.6c
9-16, Nos. 16, 17 and 18 ..4.7c
9-16, Nos. 19 and 20 ..4.8c
9-16, No. 21 ..4.9c
9 16, No. 22 ..5.0c
9-16, No. 23 ..5.1c
⅝ inch, Nos. 13, 14 and 15 ..4.8c
⅝ " Nos. 16, 17 and 18 ..4.9c
⅝ " Nos. 19 and 20 ..5.1c
⅝ " No. 21 ..5.2c
⅝ " No. 22 ..5.4c
⅝ " No. 23 ..5.5c

The prices under Hoop Iron do not apply to Cotton Ties.

1-10c per lb. extra will be charged for each gauge lighter than the lightest indicated.

1-10c per lb. extra will be charged for cutting floops to specified lengths.

Barrel Hoops.

1¼ to 2 in., cut to length.
9 to 11 lbs, per set of 7 hoops ..3.5c
8 lbs. and less than 9 lbs. per set of 6 hoops ..3.6c
Less than lbs. per set of 6 hoops ..3.8c

Extras for Cutting to Length all Preceding Iron.

All Iron, including Tire ..1.10c

Tank Iron.

No. 9 and heavier ..3.3c
Flow Slabs ..3.5c
" Wings ..3.8c

Sheet Iron.

	Common.	Charcoal.	Juniata.
No. 10 to 14	3.5c	4.0c	6.5c
No. 15 to 17	3.8c	4.3c	6.8c
No. 18 to 21	4.1c	5.5c	7.1c
No. 22 to 24	4.3c	5.8c	7.3c
No. 25 & 26	4.5c	6.0c	7.5c
No. 27	4.7c	6.2c	7.7c
No. 28	5.1c	6.6c	8.1c

All sheets No. 18 and lighter, over 30 inches wide, not less than 2.10c extra.

Wood's Patent Planished Sheet.

1st quality (A) ..10½c | 2d quality (B) ..9½c

Galvanized C. H. B.—(Charcoal Hammered Blooms.)

Nos. 14 to 20	12c	No. 27	15c
Nos. 21 to 24	13c	No. 28	16c
Nos. 25 and 26	14c	No. 29	18c

Current discount, 30 % on 35 %.

Coal Screen Iron.

1¼ by ⅝ by 5-16 ..3.0c | 1 by ⅝ by 5-16 ..3.5c

Angle Iron.

2½, 3, 3½ and 4 inch ..3.3c
1½, 1¾ 2 and 2¼ inch ..3.3c
1¼ inch ..3.4c
1 " ..3.4c
1¼ by 1 inch, for Plow Handles ..3.5c
1½ by ¾ " " ..3.8c
1½ by ¾ " " ..3.9c

T Rail.

8 lbs. to the yard ..2.9c | 20 lbs. to the yard ..2.8c
12 " " ..2.8c | 28 " " ..2.8c
16 " " ..2.8c | 40 " " ..2.8c

Splice Joints for 12, 16 and 20-lb. Rail, 4c each; 28 and 30 lb. Rail, 5c. each; 40 lb., 6c each.

3¼ by ⅝ and ½ Spikes for 20 and 28-lb. Rail ..4½c
2½ and 3 by ⅝ " " 12 and 16-lb. " ..4½c
2½ by 5-16 " " 8-lb. Rail ..5½c

Flat Rails.—Punched and Countersunk.

1¼ to 2 by ½ to ⅝ inch ..3.0c
1½ by ⅜ and 7-16 inch ..3.2c
1¾ by ⅝, 7-16 and ½ inch ..3.5c

Junista Nail Rods ..6.5c
Norway " ..8.0c
Guard Iron, 7-8x⅝x⅛ and 7-8x⅜x⅛ ..4.0c
" ¾x⅝x⅛-16 and ⅞x⅜x⅛ ..4.2c
Drag Bars ..3.2c
Dropper Bars ..3.3c
Cylinder and Landside Iron ..3.8c
Plow Beam Iron ..3.0c

Nails.

See Pittsburgh Trade Report.

Best Quality Refined Cast Steel.

Square, Flat, Octagon and Round.

⅜ to 2 inches, inclusive ..11c
5-16 and 2⅛ to 3 inches ..12c
¼ and 3⅛ to 4 " ..13c
7-32 and 4⅛ to 5 " ..14c
3-16 and 5⅛ to 6 " ..17c
5-32 inch ..21c
⅛ inch ..29c
Oil Well Steel Forgings ..19½c

Machinery Steel.

	Crucible.	Bessemer & Open Hearth
Ordinary Sizes, ⅜ to 2 inch Round	6½c	5c
5-16 and 2⅛ to 3 inches	7½c	6c
¼ and 3⅛ to 6 "	8½c	7c
7-32 inch	9½c	8c
3-16 "	11½c	10c

Square, Flat and Octagon, ½c extra throughout the list.
Cut to specified lengths, ½c extra.

Hammer Cast Steel.

2 inches and under ..7 c
Above 2 inches ..8 c

Sheet Steel.—Crucible.

To 21 gauge.	Best. 11c	2d Qual. 9c	3d Qual. 7½c	Bessemer & Open Hearth. 6c

1c. extra for each additional gauge.
Cut to multiples or specified lengths, ½c. extra.

Miscellaneous Cast Steel.

Auger and Auger Bit ..7c
Axle Steel for carriages and wagons ..7c
Frog Points and Plates ..8½c
" Side Bars ..7c
Pick, plain ..7½c
" and Mattock, beveled ..7½c
Skate Steel ..7½c
Table Cutlery ..7c
Pike and Cant Hook ..7½c
Coal and Granite Wedge ..8½c
Roller ..8c
Spindle, subject to Machinery classification ..7c
Trap Spring Steel ..8c
Forged Crank Pins and Lathe Spindles ..9c
Piston Rods, plain ..6½c
" forged to shapes ..9c
Slide Bars, plain ..9c
" forged to shapes ..6½c

Crucible, Open Hearth or Bessemer.

Boiler, Fire-Box and Flue Sheets, not less than 3-16 thick ..6½c
Boiler, Fire-Box and Flue Sheets, not less than ⅛ thick ..7c
Circulars and semi-circulars, when ordered separately ..8c
Smoke Stack, to shape ..8c
Locomotive Tank Steel ..7c

File Cast Steel.

Square, Round, Half Round and Flat Bastard, 8-inch and over ..8c
Mill Saw, 8-inch and over ..8½c
Taper, 3½-inch and over ..9½c
Horse and Shoe Rasp ..8½c

Spring Cast Steel.

Spiral and Taper, cut to lengths ..7c

Tire Cast Steel.

1x1¼ and over ..7½c
1x3-16, ⅝x3-16 and ¾ ..8c
1 and 1⅛-10x1⅛ and 5-32, ⅝x3-16 and 5-32 ..8½c
⅜ and ⅝x1⅛ and 3-32 and 12 g ..9c
Solid Safe Cast Steel ..7c

Agricultural Implement Cast Steel.

Fork and Rake, Crucible ..7c
Horse Rake Steel, cut to lengths, Crucible ..7½c
Hoe, Crucible ..6½c
Corn Stalk Cutter, beveled ..7½c
Beveled Hoe and Shovel Steel in Bars ..7½c
Crucible Plow Steel in slabs ..6c

Bessemer and Open Hearth.

Spring ..4½c
" spiral and taper, cut to lengths ..5½c
Tire, 3-16 thick and above ..4½c
Toe Calk ..4½c
Plow ..4½c
Axle Billets ..4½c
Sleigh Shoe ..4c
Cutter Shoe, cut to lengths and tapered ..5½c
Scythe Back Steel ..4c
Grain Drill Bars ..4c
" Points ..7½c
Rolling Coulter Blanks, cut and punched ..8½c
Thrasher Steel ..9½c
" Teeth ..4½c
Rolled Hammer Billets ..5½c
Terms.—Four months; 3 per cent. discount for cash, if remitted within 30 days.

Rolls and Castings.

Furnace, Floor and Straightening Plates ..2½c
Housings and Castings not otherwise specified ..3 c
Guide Plates ..3 c
Spindles and coupling boxes ..3½c
Sand Rolls and Pinions, large size ..3 c
" " small size ..3½c
Pipe Mill Castings ..3½c
Rolling Mill Castings under 50 lbs ..4 c
Spur and Bevel Wheels, large ..4 c
" " small ..3½c
Pulleys up to 30 inches ..4½c
" over 30 inches ..4½c
Engine Castings, light ..4½c
" heavy ..4½c

After Oct. 1, 1881, no discounts will be made at settlement as heretofore, prices quoted being net.

Chilled Rolls.

6 to 7 in. diam., 7 to 20 in. long ..6c
8 to 15 in. " 8 to 40 in. " ..5c
20 to 24 in. " 15 to 72 in. " ..4½c
14 to 31 in. " 72 to 108 in. " ..4½c

White and Red Lead.

Strictly Pure White Lead in Oil, in kegs, 7c.; in 25 ℔ Tin Pails, 7½c. ℔ lb over keg price; 12½ ℔ Tin Pails, 1c ℔ lb over keg price; assorted, 1 to 5 ℔ cans, 3c. per ℔ over keg price.
Dry White Lead ..7c
Red Lead, very brilliant, in kegs, 7c; in barrels 6¾c
Litharge (Potter's Lead) 7c; " " 6¾c
Freights equalized with all points.
Terms: Note at sixty days, or if paid within 15 days from date of invoice, a discount of 2½ per cent. will be allowed, but not otherwise.

Window Glass.

Per Box of 50 Feet.—Discount 60&10 % on single strength, 60&20 % on double.

Single Strength,

Size.	AA.	A.	B.	C.
5 x 8 to 10 x 15	$8.25	$7.50	$7.00	$6.50
11 x 14 to 16 x 24	9.25	8.50	8.00	7.25
18 22 to 20 x 30	10.75	9.75	8.75	7.75
15 x 36 to 24 x 30	12.25	10.75	9.00	8.50
26 x 28 to 24 x 36	13.00	11.50	9.75	9.00
26 x 36 to 26 x 44	14.50	13.25	10.75	9.50
26 x 46 to 30 x 50	15.00	14.00	11.25	10.50
30 x 52 to 30 x 54	16.00	14.50	12.00	
30 x 56 to 34 x 60	17.25	15.50	13.50	
34 x 58 to 34 x 60	18.25	17.25	15.00	
36 x 60 to 40 x 60	20.75	18.75	17.25	

Double Strength.

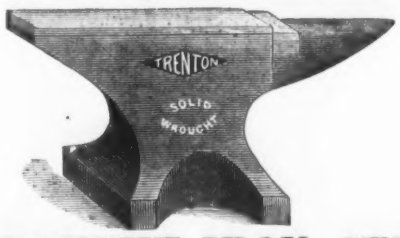
6 x 8 to 10 x 15	12.75	11.75	10.75	10.00
11 x 14 to 16 x 24	14.50	13.25	12.50	11.25
18 x 22 to 20 x 30	17.25	16.75	14.00	
15 x 36 to 24 x 30	19.75	17.25	14.50	
26 x 28 to 24 x 36	21.00	18.50	15.75	
26 x 36 to 26 x 44	23.25	21.25	17.25	
26 x 46 to 30 x 50	24.00	22.50	18.00	
30 x 52 to 30 x 54	25.75	23.25	19.25	
30 x 56 to 34 x 56	27.75	26.00	21.75	
34 x 58 to 34 x 60	29.25	27.75	24.00	
36 x 60 to 40 x 60	33.25	30.00	27.75	

An additional 10 per cent. will be charged for all glass more than 40 inches wide. All sizes above 52 inches in length and not making more than 81 united inches, will be charged in the 84 united inches bracket.

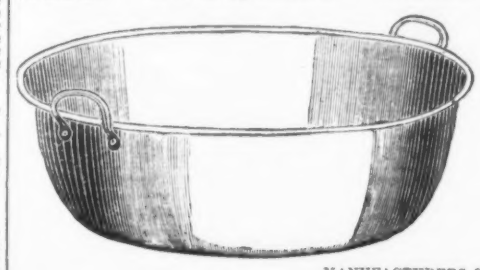
PECK & BEMIS CLEVELAND, O. MANUFACTURERS OF "STANDARD" BELTING
JOBBERS OF RUBBER GOODS AGTS N.Y. BELTING & PACKING Co.

TISCHER'S JACK.
From 5 to 30 Tons.

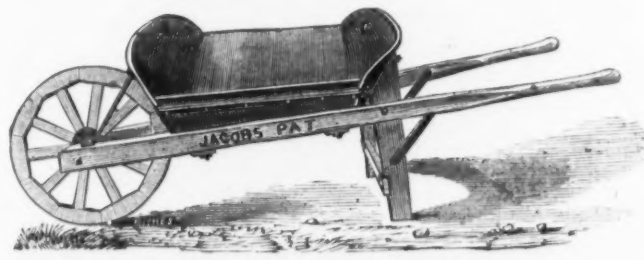
No Repairs, Packing or Alcohol.
NEVER RUNS DOWN UNDER THE LOAD.
Handier, stronger, longer lived and cheaper than any hydraulic jack.
GEO. A. OHL & CO.,
East Newark, N. J.

THE TRENTON ANVIL.


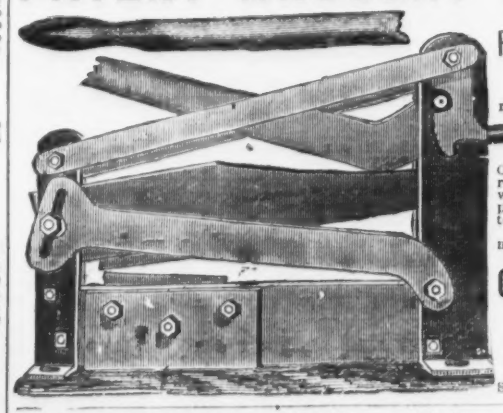
SOLID WROUGHT IRON, STEEL FACE (P. W. Pattern), WARRANTED.
Particular attention is given to the manufacture of all kinds of Anvils when drawings are furnished.
HERMANN BOKER & CO.,
101 and 103 DUANE STREET, NEW YORK.

SIDNEY SHEPARD & CO.,
PROPRIETORS OF
THE BUFFALO STAMPING WORKS.

TRADE  MARK

MANUFACTURERS OF
STAMPED & JAPANNED TIN WARE
Retinned Ware, Plain Pieced Tin Ware, Bathing Apparatus, Toilet Ware, Tin Toys, Spoons, Flesh Forks, Cake Turners, Coal and Fire Shovels, Pokers, Fry Pans, Stove Skillets, Coal Hods, Coal Vases, Water Coolers and Filters, Harness Oil Cans, Soldering Coppers.
Dripping Pans, Elbows, Milk Cans and Fixtures, Roofing Nails, Stove Boards, Transportation Cans, Buffalo Champion Ice Cream Freezers.
PERFORATED SHEET IRON FOR PAPER MANUFACTURERS AND MALT KILNS.
Grocers', Druggists' and Spice Mills' Tin Ware a Specialty.
Also, A LARGE LINE OF MISCELLANEOUS HOUSE FURNISHING HARDWARE.
Send for Illustrated Catalogue. Address
SIDNEY SHEPARD & CO.,
Buffalo, N. Y., or Chicago, Ill.

RAILROAD OR CANAL BARROW.
With Jacobs' Patent Wheel.


Full sized, bent tray, planed and well finished. Bolted securely to frame. The legs extend upward, serving as a brace to the bowl, to which they are bolted; they are also bolted to handles. This barrow has the Jacobs Patent Wheel, superior in every way to any iron wheel manufactured. The wheel revolves on a fixed axle bolt, similar to a buggy wheel. The axle bolt holds the barrow firmly together. The barrow for Railroad Contractors. Will outwear any other made, and displaces all others wherever introduced. Wheel painted.
We also manufacture a full line of
ORE, BRICK, STONE and GARDEN BARROWS.
Also,
Road Scrapers, Road Plows, Levelers, &c.
REVOLVING SCRAPER CO.,
COLUMBUS, - - - - - - - OHIO, U. S. A.

PATENT WROUGHT IRON SHEAR,
With and Without
PUNCH ATTACHMENT,
FOR IRON AND STEEL.

Our No. 101 Machine will cut 4x¾, 1¼ inch round and square and punch ⅝ inch hole through ½ inch iron. Our No. 104 Machine will cut 4x⅝, 1 inch round and square and punch ⅝ inch hole through ⅜ inch iron. Our No. 105 Machine will cut 4x⅝, 1¼ inch round and square. Our No. 106 Machine will cut 4x⅝ inch round and square. Occupies a space of 8x20 inches, weighs from 200 to 400 lbs., made of wrought iron and steel. It is built so exceedingly strong that two men cannot injure it. Prices from $30 to $45. Liberal Discount to the trade.
CLEVELAND HARDWARE CO.
CLEVELAND, OHIO,
Manufacturers of
STERLING ANTI-FRICTION BARN-DOOR HANGERS.
Send for Illustrated Circular.

PHILADELPHIA BLACK LEAD CRUCIBLE WORKS,
1324 to 1334 Callowhill St., Philadelphia, Pa.


R. B. SEIDEL,
Manufacturer of SUPERIOR BLACK LEAD CRUCIBLES.
For melting Steel, Brass and other metals. Black Lead Stopper, &c., for Bessemer Steel makers. Also manufacturer of superior quality Hammered Charcoal Iron of different sizes and shapes.

ALEXANDER BROS
BEST OAK BELTING
PHILADELPHIA.

L. M. RUMSEY MFG. CO.

MANUFACTURERS & JOBBERS OF

PUMPS AND IRON WORKING MACHINERY,

LEAD PIPE & SHEET LEAD

PLUMBERS & STEAM FITTERS, BRASS GOODS.

BARBED WIRE FENCING & FENCE WIRE.



GAS PIPE & FITTINGS

BELTING HOSE, PACKING.

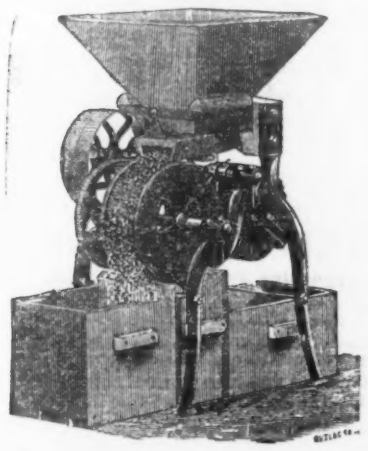
PUMP CHAIN &c.

RAILWAY SUPPLIES

No 804 TO 820 N. SECOND ST.

ST. LOUIS, MO.

B. FITTS' PATENT MAGNETIC METAL SEPARATOR.



MAGNETIC METAL SEPARATOR.

The accompanying cut represents a view of a recently invented machine for separating iron turnings, filings, &c., from brass, composition and other material.

Its capacity and utility for this kind of work surpasses anything ever before offered to the public, doing its work most thoroughly, and with the least amount of labor or trouble. The machine is not only a great labor-saving device, but brass stock treated with it is much improved, as it is thoroughly cleansed that it may be used for the best of work.

The machine may also be used for separating iron from emery.

TESTIMONIALS.

From the Walworth Manufacturing Co., Boston.
BOSTON, Jan. 18, 1879.
Mr. Ezra Sawyer, Worcester: Of the many methods we have practised in separating iron from brass turnings and filings, we have found none equal to your machine. Very truly yours,
E. C. HAMMER, Treas.

From the Benedict and Burnham Mfg. Company, Waterbury, Conn.
WATERBURY, CONN., Aug. 19, 1879.
Ezra Sawyer, Esq., Worcester.—DEAR SIR: We hand you check for Metal Separator. It appears to do the work very well, and is quite a saving of labor over the old process of cleaning our washings, and metal having iron in the same. Yours, &c.
CHAS. BENEDICT.

From Union Water Meter Company, Worcester.
We have used one of B. Fitts' Patent Magnetic Metal Separators for eighteen months, and can recommend it as the best thing we have ever seen for separating metals, and have no doubt it has more than paid for itself in its use.
UNION WATER METER CO.
WORCESTER, Sept. 1, 1879. J. C. OTIS, Treas.

From Peck Brothers & Co., New Haven, Conn.
NEW HAVEN, CONN., Sept. 3, 1879.
Ezra Sawyer, Esq.—DEAR SIR: We are pleased to inform you that the machine we purchased of you for cleaning our turnings and sweepings works admirably, and does its work thoroughly. It will very soon earn all it cost us. Respectfully yours,
J. M. PECK, Treas. PECK BROS. & CO.

From Rice, Barton & Fales Machine and Iron Co., Worcester, Mass.
WORCESTER, MASS., Sept. 4, 1879.
To Whom it may concern: We have had in use for several months one of B. Fitts' Patent Magnetic Metal Separators, and it gives us satisfaction, effecting a saving in time and material. Yours respectfully,
GEO. M. RICE, Treas.

From Brown & Brothers, Waterbury, Conn.
WATERBURY, CONN., Sept. 4, 1879.
Ezra Sawyer, Esq., Worcester, Mass.—DEAR SIR: We have used your Magnetic Metal Separator several months; it works to our satisfaction, and we cheerfully give it our recommendation. Yours truly,
H. VAN DUSEN, Agt. BROWN & BROTHERS.

Manufactured by

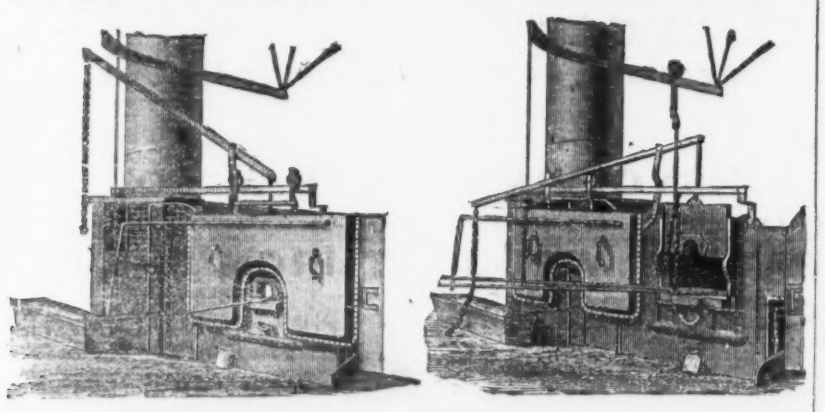
EZRA SAWYER, 33 Hermon Street, WORCESTER, MASS.

AMERICAN BOLT CO., Lowell, Mass.,

MANUFACTURERS OF

Bolts, Nuts, Washers, Chain Links, Car Bolts, Bridge Bolts, Lag Screws, &c.

McDONALD'S PATENT SHIELD.



For Protecting the Men from Heat when Working in Front of Puddling, Heating and other Furnaces.

H. McDONALD, Patentee,

MANAGER SLIGO ROLLING MILLS,

PITTSBURGH, PA.

RIPLEY & KIMBALL,

Nos. 907, 909 & 911 N. Main St., ST. LOUIS.

IRON & STEEL BOILER PLATES & SHEETS.

Brass and Iron Fittings for Steam.

Lap-Welded Pipe & Boiler Tubes

RAILWAY AND BOILER MAKERS' SUPPLIES.

AGENCY NATIONAL TUBE WORKS CO.

H. H. COLES & CO.,

446 North Twelfth Street, PHILADELPHIA.



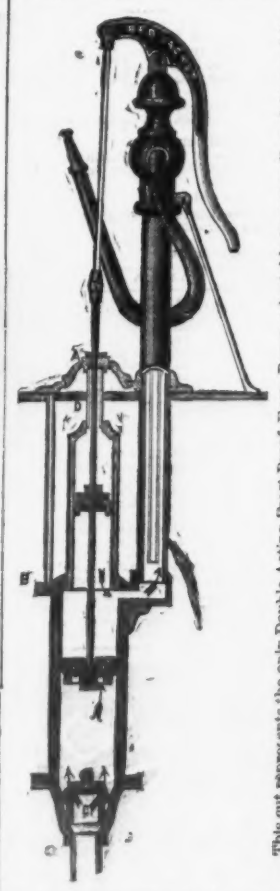
NEW CHUCKING DRILL REST.

will hold all sizes of drills up to 1¼ inches Price 60 Cents.

Martin's Celebrated

RED JACKET

Adjustable Force Pumps.



This cut represents the only Double-Acting Frost-Proof Force Pump, adaptable to any well or cistern and for all purposes; that is adjusted so the valves and plungers can be taken out, if necessary, for repair, without removing the pump, standard, cylinder, or going down into the well. Has brass drop valves and enameled cylinders. Will throw water 50 or 60 feet with ease. Any lady or child can pump them. Thousands now in satisfactory use in wells and cisterns to depths of 100 feet. No stuffing boxes to leak and keep packed; are either for right or left hand, and adapted to wind mill or hand power; are the best drive well pumps in America. Patents issued May, 1881. For descriptive circulars, price list and discounts, address

JOHN P. MARTIN, Sole Owner and Manufacturer; Office & Salesroom, 123 & 125 E. Pearl St., Cincinnati, O.



Porter & Burnham's PATENT

Picture Frame Vise

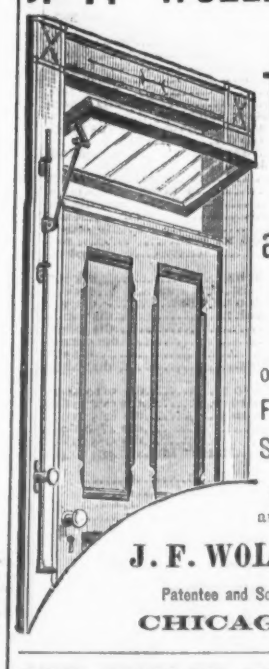
The Greatest Invention of the Age.

It has no ratchets or cogs to wear out, and is operated by a treadle, thus allowing entire freedom to both hands of the operator. It is made entirely of iron; is easily and quickly adjusted to molding of any width and frames of all sizes.

Holds both pieces of molding at once, and is the only perfect Picture Frame Vise in the market. Price, $5. Discount to the trade.

L. G. Burnham & Co
Sole Manuf'rs,
BURLINGTON, VT.

J. F. WOLLENSAK'S



PATENT

Transom Lifter and Lock.

For all kinds of Transoms, Fanlights and Skylights.

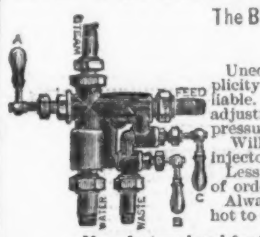
Send for catalogue and price list.

J. F. WOLLENSAK,

Patentee and Sole Manufacturer,

CHICAGO, ILL.

THE DUPLEX INJECTOR.



The Best Boiler Feeder Known.

Unequalled for simplicity and always reliable. Does not require adjustment for varying pressures of steam.

Will start when the injector is hot.

Less liable to get out of order than a pump.

Always delivers water hot to the boiler.

Manufactured and for Sale by

JAMES JENKS,

16 & 18 Atwater St., East,

DETROIT, MICH.

BOSTON.

Reported by Macomber, Bigelow & Dowse.

Anvils.—"Eagle American" ₩ lb 9½c. dis 20 %

Anvil & Vise.—
No. 1, $4.25; 2, 4.25; 3, 3.50 each.....dis 25 %

Augurs & Bits.—Snell's Auger.....dis 40&10 %
L'Hommedieu's Ship Auger.....dis 15 %
Jenning's Bitts.....dis 10&10&10 %
Cook's Bitts.....dis 40&10 %
Rheparason's Double-Cut Bitts.....dis 45 %
" " Gimlets.....dis 40 %
Stearn's Extension Hollow Augers—
No. 2, ₩ doz, $48.00, No. 3, ₩ doz, $60.00 list, dis 20 %
Bonney's Extension Hollow Augers....₩ doz $6.00
Pierce's Bitts.....dis 40 %
Griswold " .....dis 40&10 %

Axes.—Blue Jackets.....per doz 9.00
Red Cross.....per doz 8.00
" Handled.....per doz 12.00
Dowse " Boys'.....dis 33⅓ %

Ax Handles.—
Oak Extra, 31 in., No. A.....₩ doz $2.15
" 34 in., No. A.....₩ doz 2.35
" 31 in., No. B.....₩ doz 1.75
" 34 in., No. B.....₩ doz 2.00
" 31 or 34 in., No. C.....₩ doz 1.25

Axle Clips.....dis 60 %

Balances.—Chatillon's.....dis 15&10 %

Barn Door Rail.—
Cast Angle (for Anti-Friction Hangers)....per ft, 20
" Half-Round.....per ft, ⅝, 30; ¾, 40
Wrought " .....per ft, ⅝, 30; ¾, 40; ⅞, 50

Bells.—Connel's Crank Gong reduced list..dis 10&10 %

Bird Cages.
Japanned M. B. & D., reduced list, 1879.....dis 40 %
Brass " " 1879.....dis 33⅓ %

Blind Fasts.—Lock Fasts.....₩ C sets $6.00
No. 6 Fasts.....₩ C sets 5.00
Veasie Fasts.....₩ C sets 9.00
Shedd's.....₩ C sets 7.00

Blind Hinges.—Mall. Hook, 3 holes....₩ C sets 7.00

Brad Awl Handles.—
Phœnix Adjustable.....₩ doz $2.00

Bolts.—Norway Iron Carriage.....dis 70&5 %
Common " .....dis 80 %

Borax.—Refined.....₩ lb 14c

Boring Machines.
Eagle Upright each, ...$5.50 list } dis10&10%
Eagle Angle each, ...6.75 list }
Snell Augers.....₩ set 2.43

Braces.—Barber's.....dis 40& 5 %
Spofford's.....dis 50 & 5 %
Backus'.....dis 50 & 10 %

Bracket Saws.—Holly Scroll Saw.....each, $2 50
Demas Lathe and Scroll Saw....." 6 50
Bracket Saws, extra quality, to No. 6.....₩ gro $0.75
Steel Frame, with patterns.....₩ doz 6.50
Lester.....dis 20 %
New Rogers, all iron.....dis 25 %

Bracket Saw Blades.
Griffith's patent.....₩ gross 750

Brackets.—B. B. & B. Flower Pot reduced list—
.....dis 33⅓10 %
Bronzed Shelf, B. B. & B. newlist.....dis 50&10 %
Store Shelf.....dis 40&10 %

Bronze Hardware.—
Butts.—Union Fast Joint.....40%10&10 %
" Loose " .....dis 50%10&10 %
" Japanned Acorn.....dis 50%10&10 %
" Silvered " .....dis 50%10&10 %
" Boston Finish.....dis 75&10 %
Union Spiral Spring.....dis 20&10 %
Wrought Brass.....dis 75 %

Carriage Bolts.—Eagle Norway.....dis 70& 5%
" Common.....dis 80&5 %

Carriage Jacks.
"Climax" No. 1.....₩ doz $20.00
" No. 1½....." 15.00
" No. 2....." 13.50
"Universal".....dis 25 %
" No. 1.....each, $2.00
" No. 2....." 3.00
" No. 3....." 6.00
" No. 4....." 6 00
" No. 5....." 6.50

Cartridges.—U. S. Cartridge Co.....dis 70 %

Cards.—Watson's make, Horse and
" Curry.....dis 10 % } New List,
" Cotton.....dis 10 % } July 1881.
" Wool.....dis 10 % }

Casters.—Bed and Table.....dis 50 %

Chain.—Traces 6½, 10, 4, straight.....₩ pair 45c
" 6½, 10, 4, twisted.....₩ pair 50c
" 7, 12, 2, " .....₩ pair 70c
Coil 3-16.....₩ lb 11 c
" ¼.....₩ lb 8 c
" 5-16.....₩ lb 7 c
" ⅜.....₩ lb 6 c
" 7-16.....₩ lb 6½c
" ½.....₩ lb 6½c

Chalk.—White, Carpenter's.....₩ gross 80c
Red, Carpenter's.....₩ gross 80c
Blue. " .....₩ gross $1.00

Chisels.—Hart, Bliven & Mead, Framingdis50&10&10 %
Underhill, Framing.....dis 25 %
Buck's Chisels.....dis 30

Clothes Line.—
Galvanized Wire, 100 feet each.....₩ doz $4.00

Coat Hooks.—"Dover."—Galvanized, new list..dis 60 %
Japanned, new list.....dis 60 %

Coffee Mills.—New list.....dis 33⅓ & 10 %

Copper Rivets......dis 33⅓ %

Cow Ties......dis 33 ⅓%
No. 30, 3 ft. No. 6 Wire, with toggle.....₩ doz $3.80
No. 35, 3 ft. " " with snap.....₩ doz 4.00
No. 40, 3½ ft. " " with toggle.....₩ doz 4.30
No. 45, 3½ ft. " " with snap.....₩ doz 4.50
No. 50, 4 ft. No. 4 " with toggle.....₩ doz 4.70
No. 55, 4 ft. " " with snap.....₩ doz 5.00
No. 60, 4½ ft. " 3 " with toggle.....₩ doz 5.60
No. 65, 4½ ft. " " with snap.....₩ doz 6 50

Cocks.—Brass, L. F. & C.....dis 40 %

Cordage.—Manila, usual trade dis 10.....₩ lb 16
Jute.....₩ lb 9c

Crow-Bars.—Cast Steel.....₩ lb 8c
Iron Steel Pointed.....₩ lb 5c

Cutlery.—Pocket, American Shear Co.'s.....dis 40 %
Butcher Knives, "Woods." Lap Bolster.
Square Handle.....dis 30 %
Steak Knives.....dis 20%
Lap Bolster, Oval Handle.....dis 20 %

Dividers.—Cook's.....dis 25 %
Dog Collars......dis 30 %
Dog Muzzles.—Automatic.....dis 15 %

Door Springs.—Torrey's Rod.....₩ doz $2.00
Imitation Torrey's Rod.....₩ doz $1.75
Gem Coil, new list.....dis 33⅓ %
Crown.....₩ doz $1.25
Warners.....₩ doz $2.00

Door Stops.—"Thurston's".....dis 50 %

Drawer Knobs.—"Thurston's".....dis 50 %

Drills.—Morse Bitt Stock.....dis 25 %
Morse Straight Shank.....dis 20 %

Emery.—Wellington Mills.....₩ lb 10c
Walpole Emery Mills.....₩ lb 6c
Turkish in 10 lb cans.....₩ lb 8c

Enamelled Ware.
Standard Mfg. Co. Kettles.....dis40 &10 %
" Sauce Pans.....dis 25 %

Felloe Plates.—Wrought.....₩ lb

Files.
American File Co. .....dis 40%
Nicholson " .....dis 40

Fluting Machines.
Knox list, $2.00.....dis 20 %
American list, $3.40.....dis 20 %

Forks. W. C. & Co. Manure.....dis 50 %

Gimlet Bitts.
Genuine German, No. 12s, 1-32 to 8-32, per doz $1.00
Pierce's.....per doz 88c

Glass Cutters.
Combination Glass Cutter and Knife Sharpener.....₩ doz $1.0

Grub Hoes.—K. P. & Co.'s No. 2, 11.50 ₩ doz.dis 35 %

Hammers.—Maydole's.....dis 15 %
Hartford Hammer Co.....dis 20 %

Hangers & Rollers.—Anti-Friction.....dis 50 %
Acme Rollers.....dis 50 %
Climax.....dis 50 %
Common Hangers.....dis 50 %
" Rollers.....dis 50 %

Hand Screws......dis 10 %

Hatchets.—C. F. Dowse new list.....dis 33⅓ %
Underhill.....dis 25 %

Hay Knives.—Lightning.....₩ doz $18.00 net
Fisher's Patent.....₩ doz @14.00

Hinges.—Strap and T (new list).....dis45 &10&10 %
Providence Plate.....₩ lb 4%
Wrought Screw Hook.....₩ lb 4 %

Hoes.—W. C. & Co.'s.....dis 50

Hooks and Staples.—Brewers'.....new list, dis 66⅔%

Horse Nails. No. 6 7 8 9
National Finished..... .23 .21 .20 .19....dis 20 %
Putnam Pointed..... .28 .26 .25 .24....10&10 %

Horse Nails.—Bridgewater.....dis 25 %
No. 6 23; No. 7, 21, No. 8, 20; No. 9, 19.

Ice Cream Freezers.—Packer's, new list dis 40&10 %

Knobs.—"Norwalk." New list.....dis 45 %
Silver Glass.....dis 50&10 %
" Bell Pulls.....dis 50&10 %

Lanterns.—Guarded No. 99.....₩ doz 7.50
Tubulars, No. 0.....₩ doz 8.00
Railroad, Oil, No. 43.....₩ doz 9.00
Triangular.....₩ doz 4.00
Hurricane.....dis 20 %

Lawn Mowers.—The "Daisy."
12 in. cut.....each, $8.50
14 in. cut....." 9.00
16 in. cut....." 9.50
18 in. cut....." 10 00

Lead.—Sheet.....₩ lb 8c
Pipe.....₩ lb 7¾c

Locks.—Norwalk Genuine Bronze Goods.....dis 45 %
Eagle Cabinet.....dis 25 %
" Trunk.....dis 15 %
W. Wilcox & Co., Padlocks.....dis 40 %

Manure Forks.—W. C. & Co.....dis 50 %

Mattocks.—K. P. & Co., Long Cutter, 16.00 ₩ doz.
.....dis 35 %
E. P. & Co., Short Cutter, 15.50 ₩ doz.....dis 35 %
" Pick " 16.00 ₩ doz.....dis 35 %

Measuring Tapes.—Eddy's.....dis 20

Meat Cutters.—Miles' Challenge.....dis 30 %
Hale's, (New list).....dis 40 & 10 %
American.....dis 20 %

Money Drawers.—Tucker's Alarm.....₩ doz $22.50

Mouse Traps.—Delusion.....₩ doz 2.00
Novelty.....₩ doz 75

Nails......₩ keg, 3.50

Oilers.—Zinc and Tin.....dis 50 %
Brass and Copper.....dis 40 %

Ox Bows.—Extra finished and varnished.....dis 10 %
1½ in., ₩ doz. pair, $7.00 | 2 in., ₩ doz. pair....$10.00
1¾ in., " " 9.00 | 2½ " " " 12.00

Padlocks.—W. Wilcox & Co.'s.....dis 40 %

Paper.
Tarred Sheathing.....₩ lb, 2½c
Tarred Eagle Brand.....₩ lb, 2½c

Picks.—K. P. & Co., Adze Eye, 5 to 6 lb 12.00....dis 35 %
" " 6 to 7 lb 13.00....dis 35 %

Planes.—Auburn Tool Co.....dis 40 %
Fancy Planes.....dis 25 %
Razee " .....dis 30 %
N. Y. Tool Co.....dis 40 %
English Iron.....dis 30%
Bailey's.....dis 20&10 %

Plated Ware.—Rogers & Bro.....dis 10&2½ %

Pliers.—Vom Cleff & Co.'s.....net list
Burton's Wire Pliers.....dis 33⅓ %

Plumb & Levels.—Stanley, R. & L. Co..dis 5&10 %

Pocket Knives.
American Shear Co.'s.....dis 40 %

Potato Diggers.—W. C. & Co. reduced list...dis 40 %

Pulleys.
Acme or Excelsior, 1¾ in.....per doz 220
" " 2 1/2....." 250

Pulley Blocks......dis 40

Pumps.—Union Manufacturing Co.
Iron Cistern.....dis 50 %
" Pitcher Spout.....dis 50 %
Copper.....dis 50 %

Rivets.—Black.....dis 65 %
Carriage in 10 lb papers.....dis 35 %
Copper.....dis 33⅓ %

Razors.—Torrey's.....dis 20 %

Razor Strops.—Torrey's.....Full line

Rules.—Stanley.....Boxwood, dis 70&10 %
" Ivory, dis 60&10 %

Sadirons.—Common.....₩ lb 3½c
Laundry.....₩ lb 6½c
Tailor's Geese.....₩ lb 6½
Enterprise, "Potts".....dis 4 %

Sash Locks.—King & Hutchinson's, new list..dis 40 %

Sandpaper.—Baeder & Adamson.....dis 25 %
M. B. & D.....dis 25&5 %

Sash Weights.—Patent Eye.....₩ lb 1¾c

Saws.—Hand Saws, Disston's.....dis 20 %
Wheeler & Clemson.....dis 20 %
Cross-Cut Saws.
W. M. & C., Common Tooth, No. 1.....₩ foot 35c
" " Champion " .....₩ foot 35c
Disston's, Common " .....₩ foot 60c dis 40%
" Gt. American " .....₩ foot 60c dis 40%
Boynton's Lightning " .....₩ foot 45c
M. B. & D., Hand Saws.....dis 33⅓ %
W. M. & Co.'s Circular Saws.....dis 35 %
Richardson Bros.....dis 25 %

Saw Blades.—Disston.....dis 20 %
W. M. & C.....dis 10 %
Welch & Griffith, Extra.....₩ doz $8.40
" " No. 2.....₩ doz 7.00

Scales.—Fairbanks.....dis 20 %

Screws.—Aiken's Flat Head Iron....new list, dis 35%
American Flat-Head Iron....." dis 35%
" " Brass....." dis 35 %
" Round-Head " ....." dis 25 %
" " Iron " ....." dis 40 %
Grilley " Nickel plated Common, dis 40 %

Scythes.—Clippers, in boxes.....₩ doz $9.00%

Shavers.—Kimball's.....₩ inch 75c
Watrous.....dis 15 %

Shears.—American Shear Co., new list.....dis 20 %

Shot.—Tatham's.....₩ lb 7c

Shovels.—O. Ames, new list.....dis 15 %
O. Ames, other brands, new list.....dis 15 %
M. B. & D.....dis15 %
Oxford Birmingham Pattern.....dis 40%

Sinks.—Magee Patent.....dis 30 %

Snow Shovels.—Malleable tips.....$3.00

Skates.—Union.....dis 25 %
Acme.....dis 25 %
Imperial Club list No. 5, $3.75 per pair, list No. 7, 5.00 per pair.....dis 25 %

Stock and Dies.—King's.....dis 10&2½

Tacks.—A. Field & Son's.....dis 30&10 %
Pittsfield.....dis 20&10 %
Swedes Tinned.....40&10 %
Swedes Iron.....30&10 %
Gimp and Lace.....30&10 %
Copper Tacks.....30&10 %
All balances on list.....20&10 %

Traps.—Oneida, Genuine.....dis 33⅓ %
Oneida, Imitation, B. & N.....dis 50 %
Blake's.....dis 40 & 10 %

Vises.—Simpson's Adjustable.....dis 25&5 %
Howard Vise Co.....dis 25 %
Prentiss'.....dis 20 %

Weather Strips.—Packer's.....₩ doz $4.00
Browne's Flexible Rubber.....dis 30 %
In 25 feet boxes; No. 1, ½ in. wide, ₩ yard 10c. No. 2, ⅝ in., 14c.; No. 3, ¾ in., 20c.; No. 4, 1 in., 26c.
Black Walnut Spring Weather Strips....₩ doz. $3.40

Window Springs......dis 20 %
Babcock's No. 3.....₩ gross $6.25
" " 4.....₩ gross 4.15

Wire Cloth.—"Clinton".....₩ ft 3 c

Wire Fence.
Scutt's Patent, Painted.....₩ lb 8½c
" Galvanized.....₩ lb 9½c

Wire Goods.—Gate Hooks and Eyes, &c. new list.....dis 60&10 %

Wrenches.—A. G. Coe's.....dis 50 %
Girard Mfg. Co.....dis50 %
Girard Agt.....dis 70 %

Wringers.
Universal, No. 2½.....₩ doz 44.00
Novelty, No. 2.....₩ doz 44.00
Excelsior, No. A.....₩ doz 60.00
" No. B.....₩ doz 72.00
" No. CC.....₩ doz 105.00
Novelty Set Tub, 1.....₩ doz 57.00
Eureka.....₩ doz 39.00
Keystone, Wood Frame No. 1½.....₩ doz 40.00
" Iron Frame No. 2½.....₩ doz 32.00

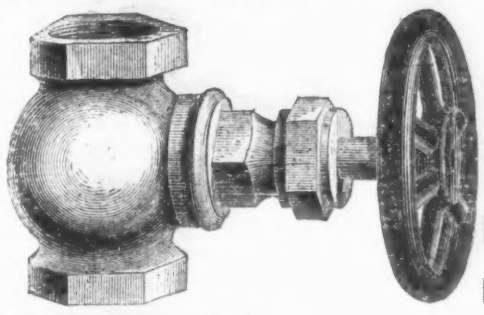
Zinc......₩ lb 7¼

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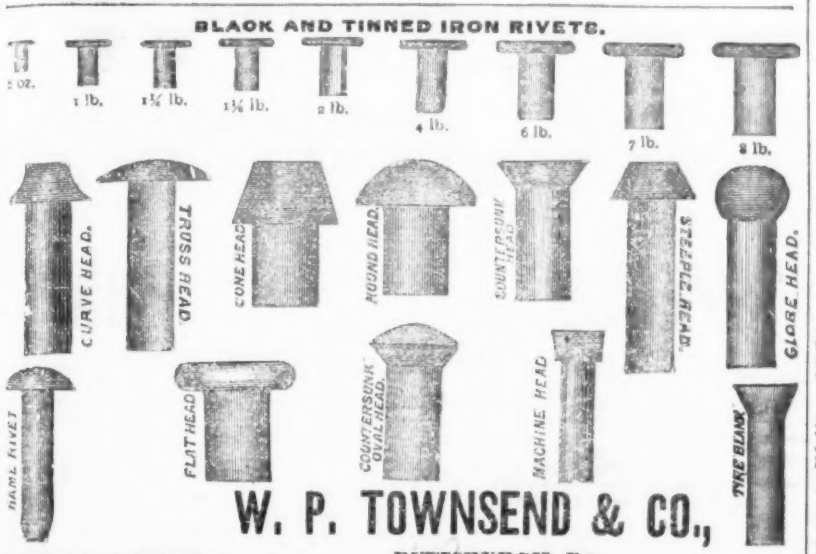
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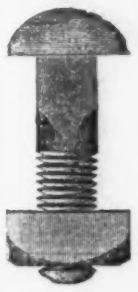
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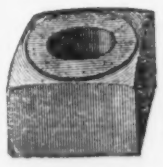
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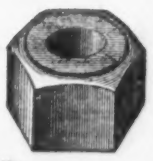
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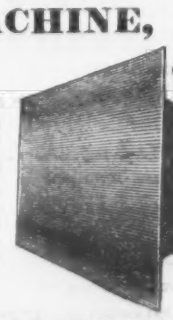
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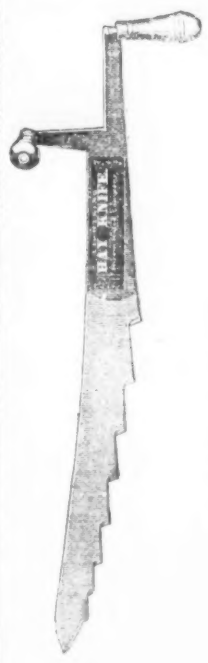
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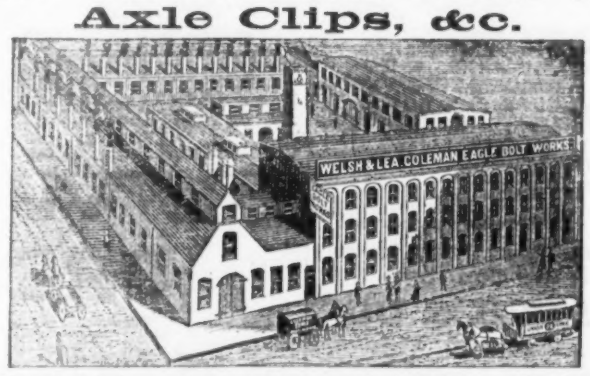
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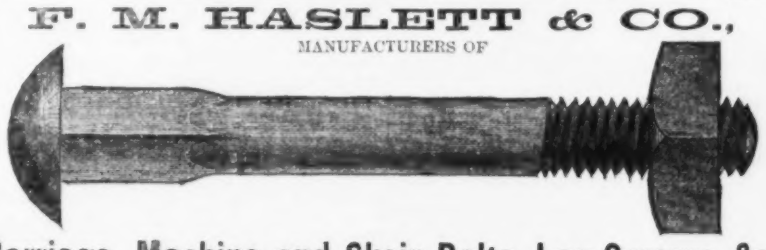
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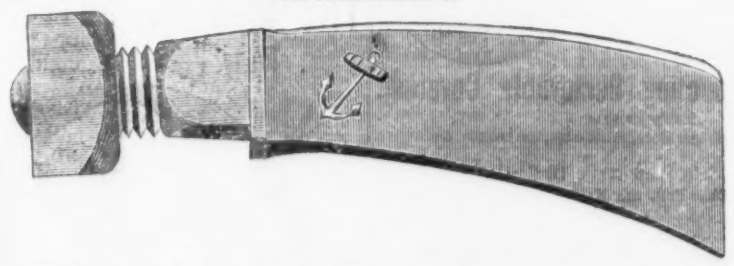
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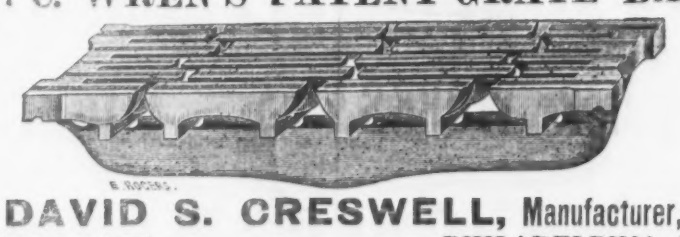
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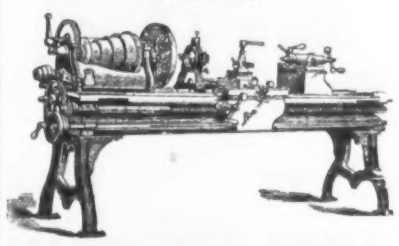
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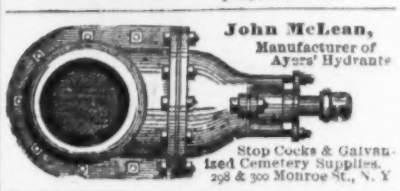
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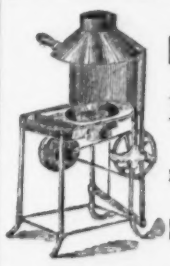


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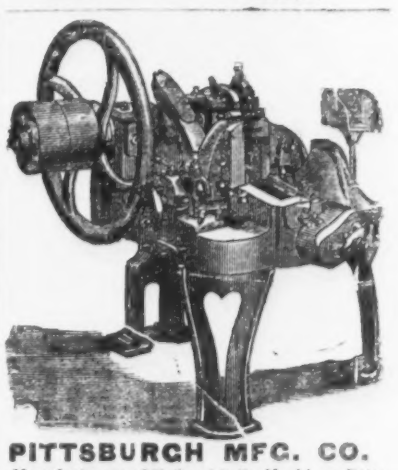
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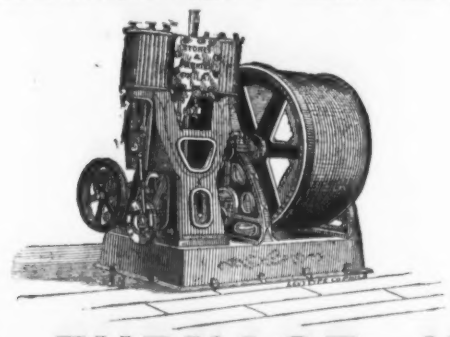
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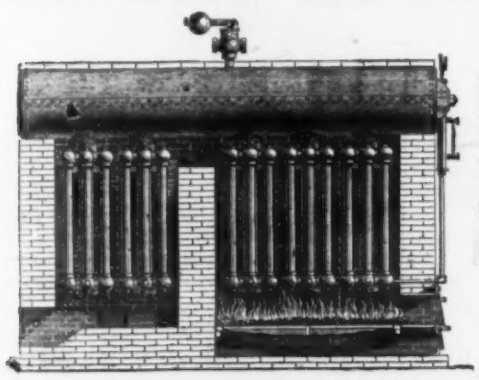
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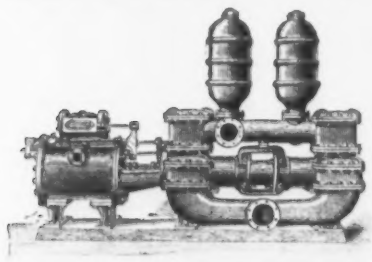
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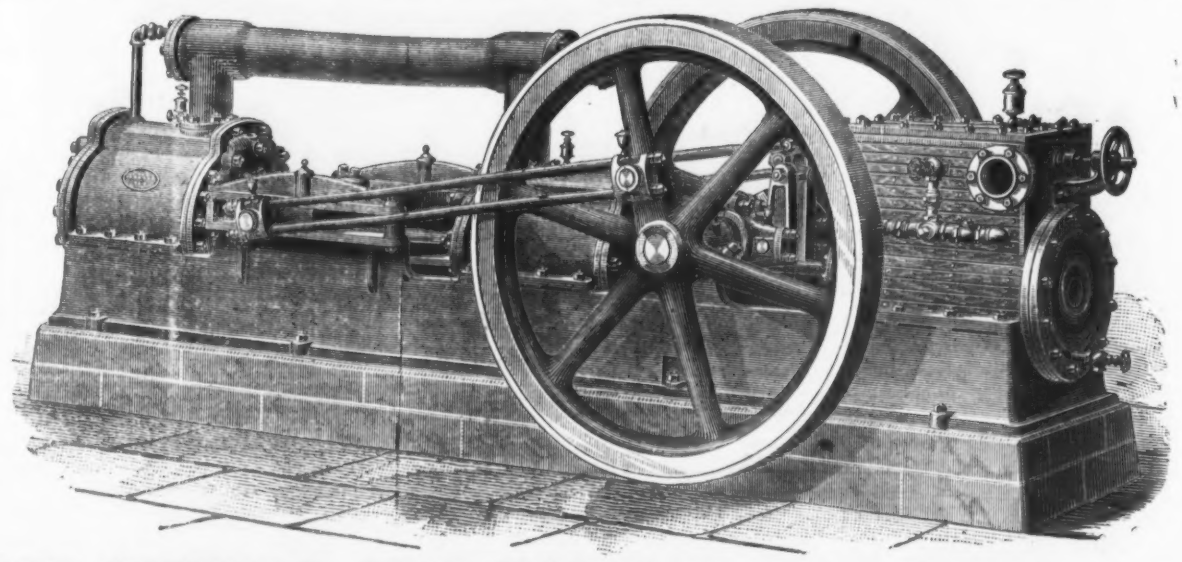
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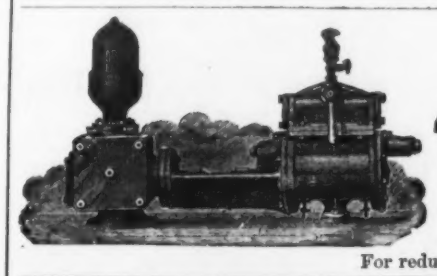
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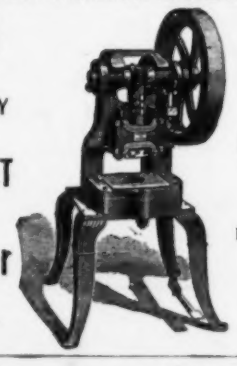
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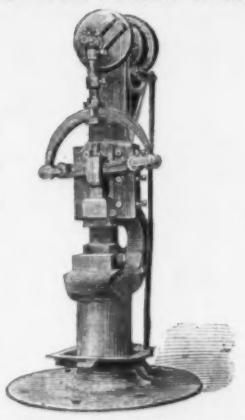
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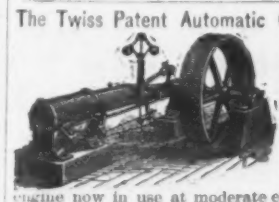
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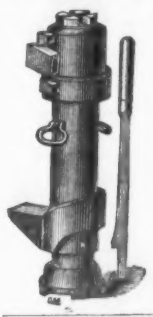
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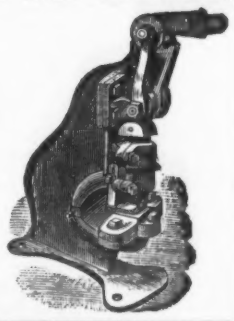
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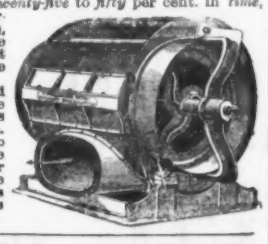


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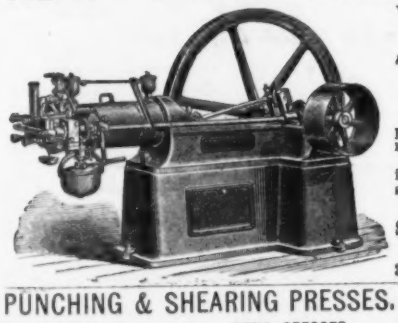
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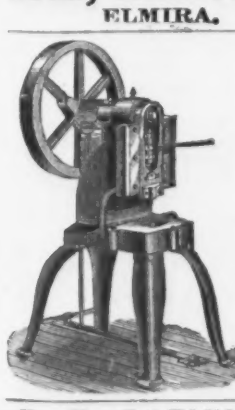
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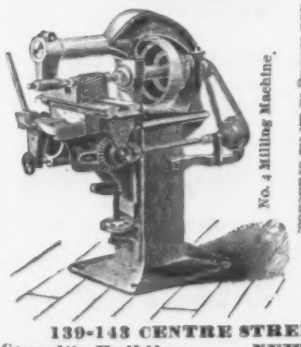


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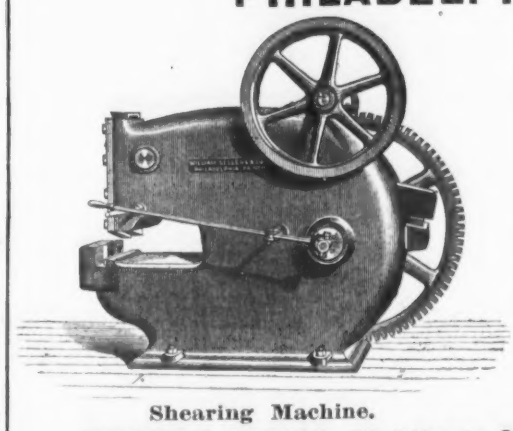
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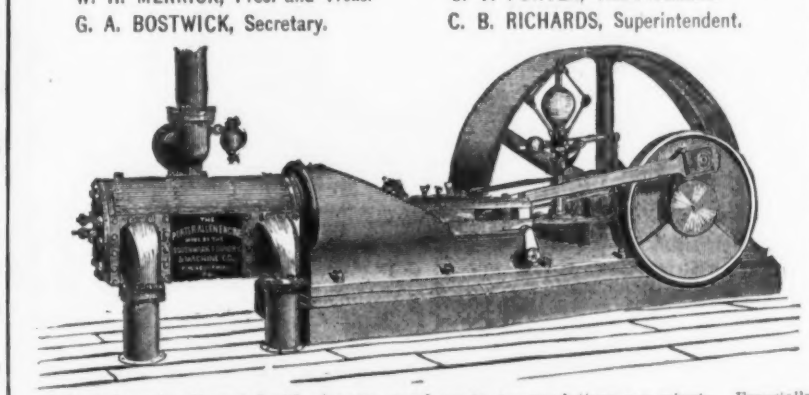
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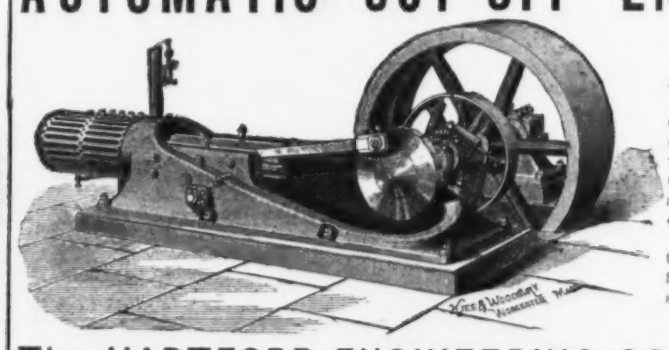
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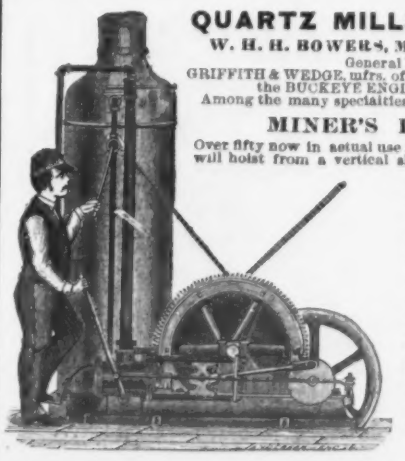
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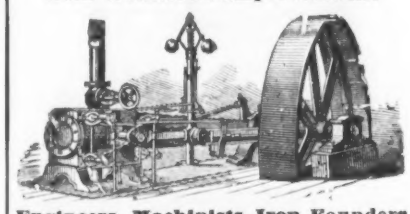
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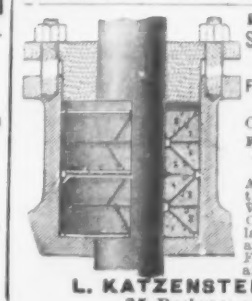
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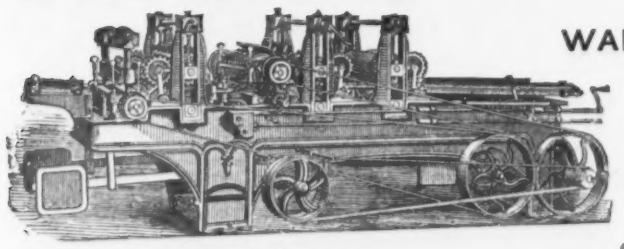
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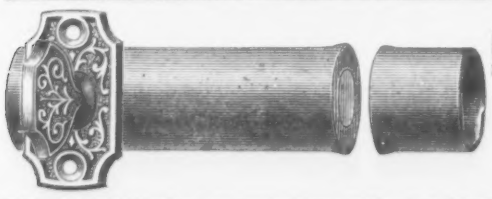
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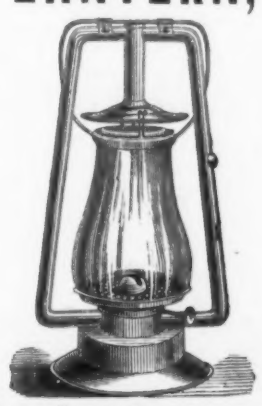
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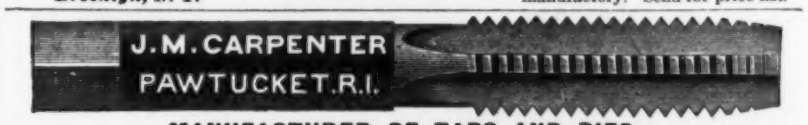
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130 to 142 First St., Brooklyn, N. Y.

AXLES

SUPERIOR WAGON, CART AND TRUCK AXLES.

Our facilities enable us to quote the trade lower prices than any other manufactory. Send for price list.



MANUFACTURER OF TAPS AND DIES.

E. M. BOYNTON,

Manufacturer of all kinds of



First-Class Saws, Frames, Cross-Cut Handles,

TOOLS, FILES, &c.

Also sole Proprietor and Manufacturer of the

GENUINE PATENT LIGHTNING SAW

80 Beekman Street, NEW YORK.

I have during the year added to my extensive facilities the construction of a new Saw Manufactory 100 feet by 90 feet, comprising 36, 38, 40 and 42 Devoe street. I have purchased costly land and erected an additional four-story brick manufactory, in order to fill special orders for my rapidly increasing business. The new addition comprises about 30,000 feet of floor space, filled with the latest improvements in automatic machinery for saw manufacturing. For grinding circular saws I have a new machine, admitted to be unsurpassed in accuracy and speed. I have also three horizontal machines for grinding cross-cuts, mill saws, hand saws, buck-saws, &c., with capacity for over 1000 saws per day.

I have added extensive File Works, but shall make only best hand-cut Files, as in filing saws I find them the cheapest at the higher cost. I can fill special orders, and shall expect at all times to have on hand, at my store, *80 Beekman Street, New York,* a few thousand dozen each Hand Saws, Cross-cuts and Files, Saw Sets, Patent Handles, &c.

CEM SPIRAL SPRING HINGES.



SINGLE ACTING.

Size.	For Doors.	No.	Per Pair.
3 inch.	1 to 1½ inch.	63	$0.80
4 "	1 " 1⅝ "	64	1.00
5 "	1 " 1½ "	65	1.25
6 "	1 " 1⅝ "	66	1.75
7 "	1¼ " 1⅝ "	67	2.25
8 "	1¼ " 2¼ "	68	3.25
10 "	1½ " 2½ "	69	4.50

DOUBLE ACTING.

Size.	For Doors.	No.	Per Pair.
3 inch.	1 to 1½ inch.	83	$1.60
4 "	1 " 1⅝ "	84	2.00
5 "	1 " 1⅝ "	85	2.50
6 "	1 " 1⅝ "	86	3.50
7 "	1¼ " 1⅞ "	87	4.50
8 "	1½ " 2¼ "	88	6.50
10 "	1¾ " 2½ "	89	9.00

SEND FOR CATALOGUE.

VAN WAGONER & WILLIAMS,

MANUFACTURERS OF

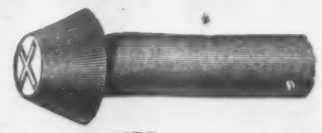
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Rivets, Spikes, Bolts, Nuts,



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